


MQL

Series B






Modular
Blower Coil Unit

ENVIRO-TEC®
BY JOHNSON CONTROLS

MQL • Table of Contents

GENERAL NOTES

- Some drawings are not shown in this catalog. Please refer to www.enviro-tec.com for complete submittal drawings for your project.
- All data herein is subject to change without notice. Refer to www.enviro-tec.com for current catalog and submittal drawings.
- Drawings not for installation purposes; refer to IOM manual at www.enviro-tec.com.
- ETL Report Number 3017723-001.
- MEA Number MEA 107-02-E applies to all units with any combination of chilled water or R-22 direct expansion coils and either hot water coils, steam coils, or electric heat.

The Perfect Solution for Schools, Hospitals, and Commercial Buildings.

The flexibility of the Model MQL Blower Coil allows you to design the unit to meet the specific project needs. The MQL design allows you to configure draw thru applications in horizontal, vertical, and footprint-saving arrangements. From basic air handling to the sophisticated isolation room systems required to meet challenging indoor air quality (IAQ), controls, and acoustic (sound sensitive) projects – the Model MQL Blower Coil is your solution!

Standard Features

- Modular construction allows for footprint saving arrangements including stacking modules in two-high configuration.
- IAQ galvanized drain pans are double sloped to prevent standing water and minimize microbial growth. Stainless steel drain pans are available.
- Removable access panels for improved accessibility, cleanability, and serviceability. Hinged access doors with quick action latches are available.
- Single point power connection – even with draw thru or blow thru electric heat – simplifies installation. Fan motors are factory mounted and wired to the junction box.
- Available in nine sizes, from 600 to 10,000 CFM.
- Internal spring isolation standard on all unit sizes 02 - 17.
- Single wall and double wall-galvanized construction are available. Double wall construction enhances indoor air quality, protects insulation, and provides the ability to clean the inside of the unit.

Optional Features

- Factory-packaged blower coils are available with starters or variable frequency drives, factory mounted and wired. Simply connect power, piping, and ductwork, and the units are ready for operation. An excellent way to minimize installation time, coordination and costs, while increasing reliability.
- Quiet, flexible, acoustical discharge plenums may be used for sound sensitive projects.
- Exhaust / Return Fan with Economizer Sections for use with IAQ applications ("free" heating and cooling – cost savings for space conditioning).
- Customized Options including:
  - Direct drive plug fans
  - High efficiency filters
  - Double wall perforated lining
  - External face and bypass dampers
  - Inspection windows

Designed For Maximum Flexibility

The ENVIRO-TEC® Model MQL Blower Coil Unit is designed to maximize flexibility of selection and installation.

The unit is also designed to exceed the stringent quality standards of the institutional market, while remaining cost competitive in the light commercial segment of the market.

ENVIRO-TEC® Model MQL sets the new standard for quality, flexibility, and competitive pricing.

For the Building Designer:

OPTIONAL COMPONENTS MEAN FLEXIBILITY

The extensive variety of standard options available on the MQL is where you find the versatility to fit any HVAC system designer's needs.

Options include: Mixing boxes with standard low leak dampers, High efficiency filter sections for 2" prefilter and 4" final filter, blow thru electric heat with single point power connection. All electric heat units are listed with ETL as an assembly and carry the cETL label.

High Efficiency motors, starters, disconnects and fusing mean easier coordination between mechanical and electrical trades.

Coil options allow for 4 or 6 row cooling coils. Water coils have optional circuiting that can be used to reduce Water Pressure Drop, which may also allow for pipe size reductions and lower material cost. Hot Water or Standard Steam coils may be placed in the Preheat or Reheat position.

All Model MQL blower coils have the option of foil faced insulation.

For the Contractor:

LOWER INSTALLED COST

Model MQL blower coils are shipped completely assembled, reducing field installation time and labor. All units are thoroughly inspected and tested prior to shipment, eliminating potential problems at startup. Motor wiring is brought to a junction box on the outside of the unit casing, reducing electrical hook-up time.

A wide variety of fan discharge configurations allow for increased flexibility and easier installation on the jobsite, resulting in cost reductions by eliminating expensive elbows, etc.

For the Owner:

QUALITY PRODUCT

Model MQL blower coil units are built from G60 minimum spangled galvanized steel with a chromate coating. This metal surpasses the ASTM 125 hour salt spray test for corrosion and rust. Standard insulation is 1 inch fiberglass insulation which is glued and pin spotted for maximum positive adhesion. Insulation complies with UL 181 and NFPA 90A.

All units, with or without Electric Heat, are ETL listed and labeled. All wiring is in compliance with NEC, assuring safety and quality for the owner.

Application Considerations

Model MQL blower coil units offer a wide range of application flexibility, while maintaining a simple, easy to install unit design. These units are intended to provide comfort cooling and heating within a small footprint. They may be applied in many types of building structures including schools, office buildings, hospitals, condominiums, assisted living facilities, apartments or stores. Applications can be constant or variable volume.

There are many applications in which the MQL product can be utilized. Some examples include:

Constant volume applications

- Two-pipe hydronic system for cooling and/or heating
- Two-pipe hydronic cooling system with electric heat
- Four-pipe system with dedicated heating and cooling coils
- Direct Expansion (DX) split systems with hydronic heat
- Direct Expansion (DX) split systems with electric heat

Variable volume applications

- Two-pipe hydronic system for cooling and/or heating.
- Two-pipe hydronic cooling system with electric heat.
- Four-pipe system with dedicated heating and cooling coils.

Acoustics

Control of noise within both occupied and unoccupied spaces has become increasingly important to designers and building owners/occupants. Proper consideration must be given to placement of indoor air conditioning units, particularly in the occupied space. Inherent flexibility of the fan and coil combination in the vertical configuration allows application in sound-sensitive areas. In such instances, a fan running at low speed with a high capacity coil normally yields satisfactory results. It also may be desirable to select a larger nominal capacity unit and operate it at a less than nominal airflow for further acoustic benefit.

Three phase motors are recommended for sound-sensitive applications to avoid potential single phase motor hum. Unit operation in the stall region of the fan curve is not recommended since it may cause unsatisfactory noise levels and excessive unit vibration.

Installation

These floor mounted or ceiling hung units can be installed on a base rail or hanger rods at the corner points. All units have internally isolated fan decks; therefore, flex connections are not required, which will reduce installation costs. One of the most important and basic IAQ issues is condensate management. The first step to ensure trouble-free operation is proper installation. It is very important that the unit be mounted high enough so that the condensate drain from the unit may be properly trapped. Please refer to the MQL IOM Manual at www.enviro-tec.com for specifics on this issue. As with all HVAC systems, these units should be installed according to all applicable ASHRAE standards, SMACNA and local code requirements.

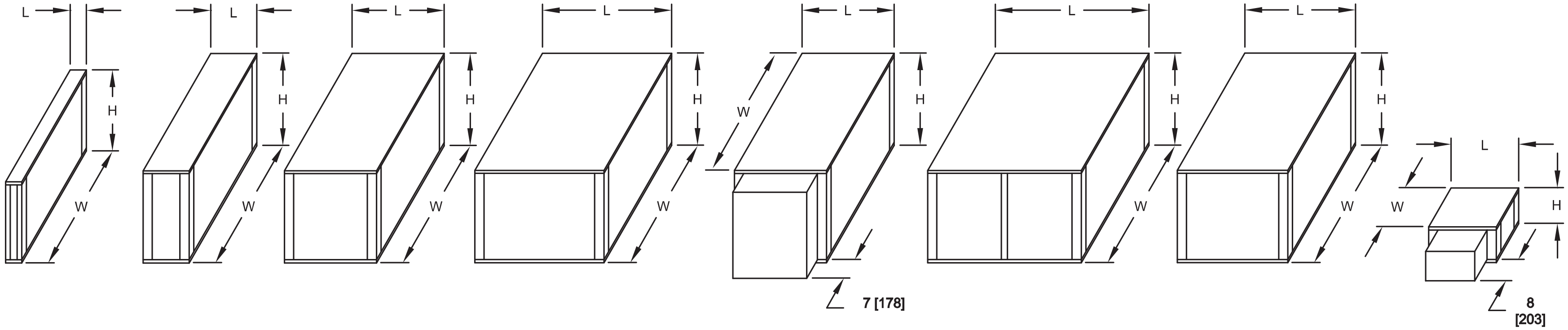
Operating Limitations

Units must not be operated above maximum fan speed or unit airflow as listed in the Fan Performance section of this catalog. Unit operation at greater than maximum fan speed could drastically reduce bearing life and may result in a catastrophic failure. Operating at greater than the maximum allowable airflow in the cooling mode may result in unsatisfactory operation due to moisture carry over from the coil. In addition, it is often not economical to operate a unit at its maximum fan speed due to the greater motor power requirements.

Units with electric heat should not be operated with leaving air temperature greater than 104°F, to prevent excessive leaving air temperatures and electric heat limit trips. A hydronic (or steam) coil and electric heat should not be operated simultaneously to prevent excessive leaving air temperatures and limit trips. Electric heat units are equipped with a lockout switch that disables the electric heater if the temperature of the hydronic (or steam) coil is greater than 104°F (40°C).

Water coils must not be operated above a fluid velocity of 8 ft./sec. to reduce the possibility of velocity induced erosion and flow noise. Water coils must not be operated below a fluid velocity of 1 ft./sec. to prevent degraded coil performance caused by laminar flow. These high or low fluid flow rates may not be included in the ARI coil certification.

ENVIRO-TEC® BY JOHNSON CONTROLS



UNIT CONFIGURATION (IN DIRECTION OF AIRFLOW)

A/F	Position:	1	2	3	4	5	6	7	8	9	10
Upper Deck - B											
Lower Deck - A											

Fig.	MQL - Module Size		Dim.	02	03	04	06	08	10	12	14	17
Fig. 1	EFM	External Flat Filters (2")	H - in (mm)	17-3/8 (441)	17-3/8 (441)	17-3/8 (441)	26-3/8 (670)	26-3/8 (670)	26-3/8 (670)	41-3/16 (1046)	41-3/16 (1046)	41-3/16 (1046)
			W - in (mm)	28 (711)	34 (864)	42 (1069)	42 (1069)	46 (1168)	56 (1422)	64 (1626)	68 (1727)	80 (2032)
			L - in (mm)	5-1/4 (133)	5-1/4 (133)	5-1/4 (133)	5-1/4 (133)	5-1/4 (133)	5-1/4 (133)	5-1/4 (133)	5-1/4 (133)	5-1/4 (133)
Fig. 2	SAM	Small Access	H - in (mm)	22 (559)	22 (559)	22 (559)	30 (762)	34 (864)	34 (864)	44 (1118)	44 (1118)	44 (1118)
	SCM	Small Coil	W - in (mm)	30 (762)	36 (914)	44 (1118)	44 (1118)	48 (1219)	58 (1473)	66 (1676)	70 (1778)	82 (2083)
	SFM	Small Flat Filters (2" and/or 4" Cartridge)	L - in (mm)	15 (381)	15 (381)	15 (381)	15 (381)	15 (381)	15 (381)	15 (381)	15 (381)	15 (381)
Fig. 2	MAM	Medium Access	H - in (mm)	22 (559)	22 (559)	22 (559)	30 (762)	34 (864)	34 (864)	44 (1118)	44 (1118)	44 (1118)
	MCM	Medium Coil	W - in (mm)	30 (762)	36 (914)	44 (1118)	44 (1118)	48 (1219)	58 (1473)	66 (1676)	70 (1778)	82 (2083)
	MFM	Med. INTELLITRAC® Mix. Box w/Flat Filters (2")	L - in (mm)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)
	MIM	Med. INTELLITRAC® Inlet Plenum w/Flat Filters (2")										
	MMM	Medium Mixing Box with Flat Filters (2")										
	MRM	Medium Inlet Plenum with Flat Filters (2")										
	MVM	Medium V-Bank Filters (2")										
Fig. 2	HFM	Horizontal FC Fan	H - in (mm)	22 (559)	22 (559)	22 (559)	30 (762)	34 (864)	34 (864)	44 (1118)	44 (1118)	44 (1118)
	HPM	Horizontal Plug Fan	W - in (mm)	30 (762)	36 (914)	44 (1118)	44 (1118)	48 (1219)	58 (1473)	66 (1676)	70 (1778)	82 (2083)
	RFM	Return FC Fan	L - in (mm)	32 (813)	32 (813)	32 (813)	36 (914)	36 (914)	36 (914)	40 (1016)	40 (1016)	40 (1016)
	RPM	Return Plug Fan										
	VCM	Vertical Coil										
	VFM	Vertical FC Fan										
Fig. 2	MBM	Medium Face & Bypass	H - in (mm)	30 (762)	30 (762)	30 (762)	40 (1016)	46 (1168)	46 (1168)	56 (1422)	58 (1473)	58 (1473)
	MTM	Medium Tall Coil	W - in (mm)	30 (762)	36 (914)	44 (1118)	44 (1118)	48 (1219)	58 (1473)	66 (1676)	70 (1778)	82 (2083)
	STM	Small Tall Coil	L - in (mm)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)
Fig. 3	EHD	Electric Heat Draw Thru	H - in (mm)	22 (559)	22 (559)	22 (559)	30 (762)	34 (864)	34 (864)	44 (1118)	44 (1118)	44 (1118)
			W - in (mm)	30 (762)	36 (914)	44 (1118)	44 (1118)	48 (1219)	58 (1473)	66 (1676)	70 (1778)	82 (2083)
			L - in (mm)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)	30 (762)
Fig. 4	LAM	Large Access	H - in (mm)	22 (559)	22 (559)	22 (559)	30 (762)	34 (864)	34 (864)	44 (1118)	44 (1118)	44 (1118)
	LFM	Lg. INTELLITRAC® Mix. Box w/V-Bank Filters (2")	W - in (mm)	30 (762)	36 (914)	44 (1118)	44 (1118)	48 (1219)	58 (1473)	66 (1676)	70 (1778)	58 (1473)
	LIM	Lg. INTELLITRAC® Inlet Plenum w/V-Bank Filters (2")	L - in (mm)	42 (1067)	42 (1067)	42 (1067)	42 (1067)	42 (1067)	42 (1067)	42 (1067)	42 (1067)	42 (1067)
	LMM	Large Mixing Box with V-Bank Filters (2")										
	LRM	Large Inlet Plenum with V-Bank Filters (2")										
	LPM	Large Discharge Plenum										
Fig. 4	FCM	FC Fan and Coil Combination (Horizontal Only)	H - in (mm)	22 (559)	22 (559)	22 (559)	30 (762)	34 (864)	34 (864)	44 (1118)	44 (1118)	44 (1118)
	HEM	Horizontal Economizer	W - in (mm)	30 (762)	36 (914)	44 (1118)	44 (1118)	48 (1219)	58 (1473)	66 (1676)	70 (1778)	82 (2083)
Fig. 5	EHB	Electric Heat Blow Thru	H - in (mm)	13-1/2 (343)	13-1/2 (343)	13-1/2 (343)	18 (457)	18 (457)	18 (457)	21 (533)	21 (533)	21 (533)
			W - in (mm)	11-1/2 (292)	11-1/2 (292)	11-1/2 (292)	17 (432)	17 (432)	17 (432)	24 (610)	24 (610)	24 (610)
			L - in (mm)	22 (559)	22 (559)	22 (559)	22 (559)	22 (559)	22 (559)	22 (559)	22 (559)	22 (559)

Notes:

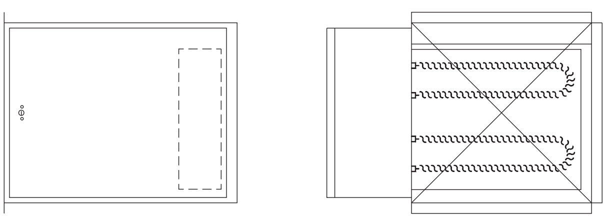
1. All dimensions are ± 1/4" (6mm). Metric values are soft conversions.
2. Section images are for identification of unit configuration only. See individual section submittal drawings at www.enviro-tec.com for details.
3. Certain configuration rules apply; see catalog and selection program for details.
4. All data subject to change without notice.

STANDARD FEATURES

- G60 galvanized steel casing
- Flanged construction for direct unit mounting, in blow thru configuration
- Listed for zero clearance installation
- Meets National Electrical Code requirements
- Ni-Chrome wire in ceramic insulators
- Stainless steel element terminals and hardware
- Element support brackets on maximum 3 1/2" centers
- Solid cover with continuous full height hinge
- Overtemperature protection
- All internal wiring rated for 105°C minimum
- Airflow switch
- Incoming line power distribution block
- ETL Listed in compliance with UL/ANSI Standard 1995
- Single point power connection
- Heater factory mounted to unit with ETL listing as an assembly

OPTIONAL FEATURES

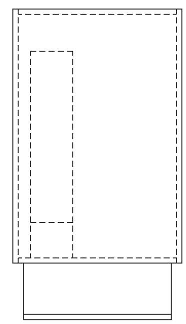
- Main incoming power disconnect (non-fused) (fused)
- Fusing (main) (per stage)
- Magnetic contactors wired for disconnecting operation
- Solid state relay with 4-20 mA, thermistor 0-135 Ohm, 0-16 VDC, or 6-9 VDC control
- Fan control package with heater interlock contacts (required for single point power connection)
- De-rated elements (for longer life)



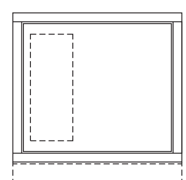
Side View   Front View

Airflow

Blow Thru
(installed on unit discharge)



Plan View



Airflow

Side View

Draw Thru
(installed upstream of fan)

HEATER AMP CALCULATION	
VOLTAGE	**AMPs per kW**
115/1	8.70
208/1	4.81
230/1	4.35
277/1	3.61
208/3	2.78
230/3	2.51
460/3	1.26
575/3	1.00

C INTERTEK ETL LISTED US

1. Refer to MCA/MOP Calculator at www.enviro-tec.com for MCA and/or MOP calculations.
2. Non-Fused Door Interlock Disconnect Switch shall be sized according to MCA.
3. Fused Door Interlock Disconnect Switch and Main Fusing shall be sized according to MOP.
4. Heaters above 480v must utilize one time secondary limits only.

Unit Voltage and Phase			Blow-Thru Electric Heat																	
			Unit Size																	
			02		03		04		06		08		10		12		14		17	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Single Phase	115	kW	3	5	3	5	4	5												
		AMPs	26.1	43.5	26.1	43.5	34.8	43.5												
	208	kW	3	9	3	9	4	9	6	9	7	9								
		AMPs	14.4	43.3	14.4	43.3	19.2	43.3	28.8	43.3	33.7	43.3								
	230	kW	3	11	3	11	4	11	6.0	11	7	11	9	11						
		AMPs	13.0	47.8	13.0	47.8	17.4	47.8	26.1	47.8	30.4	47.8	39.1	47.8						
	277	kW	3	13	3	13	4	13	6.0	13	7	13	9	13						
		AMPs	10.8	46.9	10.8	46.9	14.4	46.9	21.7	46.9	25.3	46.9	32.5	46.9						
Three Phase	208	kW	3	13	3	16	4	16	4.0	16	7	16	9	16	12	16	14	16		
		AMPs	8.3	36.1	8.3	44.4	11.1	44.4	11.1	44.4	19.4	44.4	25.0	44.4	33.3	44.4	38.9	44.4		
	230	kW	3	13	3	18	4	18	4.0	18	7	18	9	18	12	18	14	18	16	18
		AMPs	7.5	32.6	7.5	45.2	10.0	45.2	10.0	45.2	17.6	45.2	22.6	45.2	30.1	45.2	35.1	45.2	40.2	45.2
	460	kW	3	13	3	20	4	26	4.0	26	7	38	9	38	12	38	14	38	16	38
		AMPs	3.8	16.3	3.8	25.1	5.0	32.6	5.0	32.6	8.8	47.7	11.3	47.7	15.1	47.7	17.6	47.7	20.1	47.7
	575	kW	3	13	3	20	4	26	4.0	26	7	46	9	46	12	46	14	46	16	46
		AMPs	3.0	13.1	3.0	20.1	4.0	26.1	4.0	26.1	7.0	46.2	9.0	46.2	12.0	46.2	14.1	46.2	16.1	46.2

Notes:

1. Blow thru heaters can have a maximum of two stages.
2. VFD controllers cannot be supplied with blow thru heaters.
3. Specific kW ratings are available within the ranges shown. Refer to selection program.
4. Heaters above 480v must utilize one time secondary limits only.

Unit Voltage and Phase			Draw-Thru Electric Heat																	
			Unit Size																	
			02		03		04		06		08		10		12		14		17	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Single Phase	115	kW	3	5	3	5	4	5												
		AMPs	26.1	43.5	26.1	43.5	34.8	43.5												
	208	kW	3	10	3	10	4	10	6.0	16	7	16	9	20						
		AMPs	14.4	48.1	14.4	48.1	19.2	48.1	28.8	76.9	33.7	76.9	43.3	96.2						
	230	kW	3	11	3	11	4	11	6.0	18	7	18	9	22						
		AMPs	13.0	47.8	13.0	47.8	17.4	47.8	26.1	78.3	30.4	78.3	39.1	95.7						
	277	kW	3	13	3	13	4	13	6.0	22	7	22	9	26						
		AMPs	10.8	46.9	10.8	46.9	14.4	46.9	21.7	79.4	25.3	79.4	32.5	93.9						
Three Phase	208	kW	3	13	3	20	4	26	4.0	26	7	28	9	34	12	46	14	46	16	46
		AMPs	8.3	36.1	8.3	55.5	11.1	72.2	11.1	72.2	19.4	77.7	25.0	94.4	33.3	127.7	38.9	127.7	44.4	127.7
	230	kW	3	13	3	20	4	26	4.0	26	7	32	9	34	12	49	14	49	16	49
		AMPs	7.5	32.6	7.5	50.2	10.0	65.3	10.0	65.3	17.6	80.3	22.6	85.3	30.1	123.0	35.1	123.0	40.2	123.0
	460	kW	3	13	3	20	4	26	4.0	26	7	52	9	64	12	76	14	88	16	96
		AMPs	3.8	16.3	3.8	25.1	5.0	32.6	5.0	32.6	8.8	65.3	11.3	80.3	15.1	95.4	17.6	110.4	20.1	120.5
	575	kW	3	13	3	20	4	26	4.0	26	7	52	9	64	12	76	14	88	16	96
		AMPs	3.0	13.1	3.0	20.1	4.0	26.1	4.0	26.1	7.0	52.2	9.0	64.3	12.0	76.3	14.1	88.4	16.1	96.4

Notes:

1. Draw thru heaters can have a maximum of four stages.
2. All heaters that have an AMP draw greater than 48 AMPs will have a minimum of two stages.
3. Specific kW ratings are available within the ranges shown. Refer to selection program.
4. Heaters above 480v must utilize one time secondary limits only.

ENVIRO-TEC® offers hot water, chilled water, direct expansion (DX), and standard steam coils for specific application with all Model MQL blower coils. Coils tested in accordance with ARI 410, and strict on-site inspection before, during, and after installation guarantees the highest quality and performance available.

Standard Features

- ENVIRO-TEC® coils are designed, manufactured and tested by Johnson Controls
- 1/2" O.D. seamless copper tubes
- Aluminum fin construction with die-formed spacer collars for uniform spacing
- Mechanically expanded copper tubes leak tested to a minimum 450 PSIG air pressure under water
- Manual air vent plug on all water coils
- Copper ODM sweat connections
- 300 PSIG working pressure at 200°F
- Evaporator coils are factory sealed and charged with a minimum of 5 PSIG nitrogen or refrigerated dry air
- Refrigerant coils are provided with a fixed orifice distributor. Thermal expansion valves are not included.
- Steam coils rated at maximum for 15 PSIG
- 0.016" tube wall thickness (0.025" on steam)

Optional Features

- Stainless steel coil casings
- Automatic air vents on water coils
- Elevated working pressure ratings
- Heat pump compatible cooling coils
- Double circuit DX coils (50-50 split)
- 0.025" tube wall thickness

COIL AND FILTER DATA

Unit Sizes	Coil	Flat Filters			V-Bank Filters		
	Face Area	Qty.	Dimensions	Face Area	Qty.	Dimensions	Face Area
02	2.1 [0.20]	1	16x20x2 [406x508x51]	2.2 [0.20]	2	16x20x2 [406x508x51]	4.4 [0.41]
03	2.9 [0.27]	1	16x25x2 [406x635x51]	2.8 [0.26]	2	16x25x2 [406x635x51]	5.6 [0.52]
04	3.8 [0.35]	2	16x20x2 [406x508x51]	4.4 [0.41]	2	20x25x2 [508x635x51]	6.9 [0.64]
06	5.6 [0.52]	2	20x25x2 [508x635x51]	6.9 [0.64]	4	20x20x2 [508x508x51]	11.1 [1.03]
08	7.4 [0.69]	2	20x25x2 [508x635x51]	6.9 [0.64]	2 2	16x20x2 [406x508x51] 20x25x2 [508x635x51]	11.4 [1.06]
10	9.7 [0.90]	1 2	16x25x2 [406x635x51] 20x25x2 [508x635x51]	9.7 [0.90]	2 4	16x20x2 [406x508x51] 20x20x2 [508x508x51]	15.6 [1.45]
12	12.6 [1.17]	4	20x25x2 [508x635x51]	13.9 [1.29]	6	20x25x2 [508x635x51]	20.8 [1.93]
14	14.3 [1.33]	8	16x20x2 [406x508x51]	17.8 [1.65]	3 6	20x25x2 [508x635x51] 20x20x2 [508x508x51]	27.1 [2.52]
17	17.0 [1.58]	6	20x25x2 [508x635x51]	20.8 [1.93]	12	20x20x2 [508x508x51]	33.3 [3.09]

NOTES:

1. Standard filters are 2" throwaway; optional filters are 2" pleated.
2. Filter sizes are nominal and standard size, measured in inches [millimeters].
3. Coil and filter face areas are measured in square feet [square meters].
4. Cooling and heating coils have same face area.
5. For coil connection sizes, refer to the ENVIRO-TEC® Coil Selection Program.

ENVIRO-TEC® BY JOHNSON CONTROLS

Section Pressure Drops

COMPONENT AIR PRESSURE DROP (IN. W.G.)															
Unit Size	CFM	Cabinet Losses									Damper Losses			Electric Heater Losses	
		Mixing Box	Economizer	Fan Modules		Filter Modules	Coil Modules		Access Modules	Plenum Module	Mixing Box		Economizer	Blow Thru	Draw Thru
		MFM LFM MMM LMM	HEM	FCM	RFM VFM	SFM MVM	SCM MCM	VCM	SAM MAM LAM	LPM	MFM LFM	MMM LMM	HEM	EHB	EHD
02	600	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.04	0.02	0.04	0.02	0.01
	850	0.02	0.04	0.02	0.02	0.03	0.03	0.04	0.03	0.04	0.06	0.04	0.07	0.04	0.01
	975	0.02	0.04	0.02	0.02	0.04	0.04	0.04	0.04	0.04	0.07	0.05	0.09	0.06	0.01
	1100	0.03	0.05	0.03	0.03	0.05	0.05	0.05	0.05	0.05	0.08	0.06	0.11	0.08	0.01
03	900	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.06	0.02	0.06	0.05	0.01
	1250	0.02	0.04	0.02	0.02	0.03	0.03	0.04	0.03	0.04	0.09	0.03	0.10	0.10	0.01
	1425	0.03	0.05	0.02	0.02	0.04	0.04	0.05	0.04	0.05	0.11	0.04	0.13	0.13	0.01
	1600	0.03	0.06	0.03	0.03	0.05	0.05	0.06	0.05	0.06	0.13	0.05	0.16	0.17	0.01
04	1200	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.04	0.02	0.07	0.09	0.01
	1600	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.06	0.03	0.12	0.17	0.01
	1800	0.02	0.04	0.02	0.02	0.04	0.04	0.04	0.04	0.04	0.07	0.04	0.15	0.21	0.01
	2000	0.03	0.05	0.02	0.02	0.04	0.04	0.05	0.04	0.05	0.09	0.05	0.19	0.27	0.01
06	1800	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.04	0.02	0.07	0.04	0.01
	2500	0.02	0.04	0.02	0.02	0.03	0.03	0.04	0.03	0.04	0.06	0.03	0.13	0.09	0.01
	2850	0.03	0.05	0.02	0.02	0.04	0.04	0.05	0.04	0.05	0.08	0.04	0.17	0.12	0.01
	3200	0.03	0.06	0.03	0.03	0.05	0.05	0.06	0.05	0.06	0.09	0.05	0.21	0.15	0.01
08	2300	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.06	0.07	0.01
	3250	0.02	0.04	0.02	0.02	0.03	0.03	0.04	0.03	0.04	0.05	0.03	0.12	0.15	0.01
	3725	0.03	0.05	0.02	0.02	0.04	0.04	0.05	0.04	0.05	0.06	0.04	0.16	0.20	0.01
	4200	0.03	0.06	0.03	0.03	0.05	0.05	0.06	0.05	0.06	0.07	0.05	0.20	0.26	0.01
10	2900	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.09	0.12	0.01
	4100	0.02	0.04	0.02	0.02	0.03	0.03	0.04	0.03	0.04	0.04	0.03	0.17	0.25	0.01
	4700	0.03	0.05	0.02	0.02	0.04	0.04	0.05	0.04	0.05	0.06	0.04	0.22	0.33	0.01
	5300	0.03	0.06	0.03	0.03	0.05	0.05	0.06	0.05	0.06	0.07	0.05	0.27	0.42	0.01
12	3800	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.02	0.08	0.07	0.01
	5325	0.02	0.03	0.01	0.01	0.02	0.02	0.03	0.02	0.03	0.07	0.04	0.16	0.14	0.01
	6090	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.09	0.05	0.21	0.18	0.01
	6850	0.02	0.04	0.02	0.02	0.03	0.03	0.04	0.03	0.04	0.11	0.06	0.26	0.23	0.01
14	4400	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.08	0.09	0.01
	6200	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.15	0.19	0.01
	7100	0.02	0.04	0.02	0.02	0.03	0.03	0.04	0.03	0.04	0.05	0.04	0.20	0.25	0.01
	8000	0.03	0.05	0.02	0.02	0.04	0.04	0.05	0.04	0.05	0.07	0.05	0.25	0.32	0.01
17	5100	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.10	0.13	0.01
	7225	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.20	0.26	0.01
	8290	0.02	0.04	0.02	0.02	0.03	0.03	0.04	0.03	0.04	0.05	0.05	0.26	0.35	0.01
	9350	0.02	0.04	0.02	0.02	0.04	0.04	0.04	0.04	0.04	0.06	0.06	0.33	0.45	0.01

Notes:

1. Figures do not include pressure drop of internal filter media. Refer to Air Pressure Drop Through Filter Section table for filter air pressure drop adders.
2. Figures do not include pressure drop of internal heating and/or cooling coils. Refer to Air Pressure Drop Through Dry Coil Section table for coil air pressure drop adders.
3. Mixing box with single damper in fully opened position operating at 100% air volume.
4. Economizer with outside air and exhaust dampers in fully opened position operating at 100% air volume.

Filter Pressure Drops

AIR PRESSURE DROP THROUGH FILTER SECTION (IN. W.G.)														
Filter Type	Size & Efficiency	Air Velocity (FPM)												
		200	250	300	350	400	450	500	550	600	650	700	750	800
High Efficiency Pleated	2" @ 30%	0.12	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39	0.42	0.45	0.48
	4" @ 65%	0.18	0.23	0.27	0.32	0.36	0.41	0.45	0.50	0.54	0.59	0.63	0.68	0.72
	4" @ 85%	0.26	0.33	0.39	0.46	0.52	0.59	0.65	0.72	0.78	0.85	0.91	0.98	1.04
	4" @ 95%	0.30	0.38	0.45	0.53	0.60	0.68	0.75	0.83	0.90	0.98	1.05	1.13	1.20

Notes:
1. Figures listed represent air pressure drop of clean filters.
2. Usable pressure drop across pleated media not recommended to exceed 1.0 inch w.g.
3. Air velocities associated with pressure drops in the shaded region not recommended.

Coil Pressure Drops

AIR PRESSURE DROP THROUGH DRY COIL SECTION (IN. W.G.)														
Rows	Fins per Inch	Air Velocity (FPM)												
		200	250	300	350	400	450	500	550	600	650	700	750	800
1	8	0.01	0.02	0.03	0.04	0.05	0.05	0.06	0.08	0.09	0.10	0.11	0.13	0.14
	10	0.02	0.03	0.03	0.04	0.05	0.06	0.07	0.09	0.10	0.11	0.13	0.15	0.16
	12	0.02	0.03	0.04	0.05	0.06	0.07	0.09	0.10	0.11	0.13	0.15	0.16	0.18
	14	0.02	0.03	0.04	0.05	0.07	0.08	0.10	0.11	0.13	0.14	0.16	0.18	0.20
2	8	0.03	0.04	0.06	0.07	0.09	0.11	0.13	0.15	0.17	0.20	0.23	0.25	0.28
	10	0.04	0.05	0.07	0.09	0.11	0.13	0.15	0.17	0.20	0.23	0.26	0.29	0.32
	12	0.04	0.06	0.08	0.10	0.12	0.14	0.17	0.20	0.23	0.26	0.29	0.33	0.36
	14	0.05	0.07	0.09	0.11	0.13	0.16	0.19	0.22	0.25	0.29	0.33	0.36	0.40
3	8	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.23	0.26	0.30	0.34	0.38	0.42
	10	0.05	0.08	0.10	0.13	0.16	0.19	0.22	0.26	0.30	0.34	0.39	0.44	0.48
	12	0.06	0.09	0.12	0.15	0.18	0.22	0.26	0.30	0.34	0.39	0.44	0.49	0.55
	14	0.07	0.10	0.13	0.16	0.20	0.24	0.29	0.33	0.38	0.43	0.49	0.55	0.61
4	8	0.06	0.09	0.11	0.15	0.18	0.22	0.26	0.30	0.35	0.40	0.45	0.51	0.57
	10	0.07	0.10	0.13	0.17	0.21	0.25	0.30	0.35	0.40	0.46	0.52	0.58	0.65
	12	0.08	0.12	0.15	0.19	0.24	0.29	0.34	0.40	0.46	0.52	0.58	0.65	0.73
	14	0.09	0.13	0.17	0.22	0.27	0.32	0.38	0.44	0.51	0.58	0.65	0.73	0.81
6	8	0.09	0.13	0.17	0.22	0.27	0.33	0.39	0.45	0.52	0.60	0.68	0.76	0.85
	10	0.11	0.15	0.20	0.26	0.32	0.38	0.45	0.52	0.60	0.69	0.78	0.87	0.97
	12	0.12	0.17	0.23	0.29	0.36	0.43	0.51	0.59	0.68	0.78	0.88	0.98	1.09
	14	0.14	0.20	0.26	0.33	0.40	0.48	0.57	0.66	0.76	0.87	0.98	1.09	1.21
8	8	0.12	0.17	0.23	0.29	0.36	0.44	0.52	0.61	0.70	0.80	0.90	1.01	1.13
	10	0.14	0.20	0.27	0.34	0.42	0.51	0.60	0.70	0.80	0.92	1.04	1.16	1.29
	12	0.16	0.23	0.31	0.39	0.48	0.58	0.68	0.79	0.91	1.04	1.17	1.31	1.45
	14	0.19	0.26	0.35	0.44	0.54	0.65	0.76	0.89	1.02	1.15	1.30	1.46	1.62

Note: Dehumidifying cooling coils with face velocities exceeding 525 fpm not recommended.

ENVIRO-TEC® BY JOHNSON CONTROLS

Coil Weight Data

COIL WEIGHTS													
UNIT SIZE	COIL ROWS	DRY COIL				100% WATER				40% GLYCOL			
		8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
02	1	10 [5]	11 [5]	11 [5]	11 [5]	12 [5]	12 [5]	13 [6]	13 [6]	12 [5]	12 [5]	13 [6]	13 [6]
	2	16 [7]	16 [7]	17 [8]	18 [8]	19 [9]	20 [9]	21 [10]	21 [10]	20 [9]	20 [9]	21 [10]	22 [10]
	3	21 [10]	22 [10]	23 [11]	24 [11]	27 [12]	28 [13]	29 [13]	30 [14]	27 [12]	28 [13]	29 [13]	30 [14]
	4	28 [13]	29 [13]	30 [14]	32 [14]	35 [16]	36 [16]	37 [17]	39 [18]	35 [16]	36 [16]	38 [17]	39 [18]
	6	40 [18]	42 [19]	44 [20]	46 [21]	51 [23]	53 [24]	55 [25]	57 [26]	51 [23]	53 [24]	55 [25]	58 [26]
	8	57 [26]	61 [28]	65 [30]	69 [31]	71 [32]	75 [34]	79 [36]	83 [38]	72 [33]	76 [34]	80 [36]	84 [38]
03	1	13 [6]	13 [6]	13 [6]	14 [6]	15 [7]	16 [7]	16 [7]	17 [8]	15 [7]	16 [7]	16 [7]	17 [8]
	2	19 [9]	20 [9]	21 [10]	22 [10]	24 [11]	25 [12]	26 [12]	27 [12]	25 [11]	26 [12]	27 [12]	28 [13]
	3	26 [12]	28 [13]	29 [13]	31 [14]	34 [15]	35 [16]	37 [17]	38 [17]	34 [15]	36 [16]	37 [17]	39 [17]
	4	34 [15]	36 [16]	38 [17]	40 [18]	44 [20]	46 [21]	48 [22]	50 [23]	44 [20]	46 [21]	48 [22]	50 [23]
	6	50 [23]	53 [24]	56 [25]	59 [27]	64 [29]	67 [31]	70 [32]	73 [33]	65 [20]	68 [31]	71 [32]	74 [34]
	8	71 [32]	76 [34]	81 [37]	86 [39]	89 [41]	95 [43]	100 [45]	105 [47]	91 [41]	96 [43]	101 [46]	106 [48]
04	1	15 [7]	15 [7]	16 [7]	17 [8]	18 [8]	18 [8]	19 [9]	20 [9]	18 [8]	19 [9]	19 [9]	20 [9]
	2	23 [11]	24 [11]	26 [12]	27 [12]	29 [13]	30 [14]	32 [15]	33 [15]	30 [13]	31 [14]	32 [15]	33 [15]
	3	32 [14]	33 [15]	35 [16]	37 [17]	40 [18]	42 [19]	44 [20]	46 [21]	41 [19]	43 [19]	45 [20]	47 [21]
	4	41 [19]	44 [20]	46 [21]	49 [22]	53 [24]	55 [25]	58 [26]	60 [27]	54 [24]	56 [25]	59 [27]	61 [28]
	6	60 [27]	64 [29]	68 [31]	72 [33]	78 [35]	82 [37]	86 [39]	89 [41]	79 [36]	83 [38]	87 [39]	90 [41]
	8	80 [36]	85 [38]	90 [41]	95 [43]	103 [47]	108 [49]	113 [51]	118 [54]	105 [47]	110 [50]	115 [52]	120 [54]
06	1	19 [9]	20 [9]	21 [10]	22 [10]	24 [11]	25 [11]	26 [12]	27 [12]	24 [11]	25 [11]	26 [12]	27 [12]
	2	32 [14]	34 [15]	36 [16]	38 [17]	41 [19]	43 [20]	45 [20]	47 [21]	42 [19]	43 [20]	45 [20]	47 [21]
	3	45 [20]	48 [22]	50 [23]	53 [24]	58 [26]	61 [28]	64 [29]	67 [30]	59 [27]	62 [28]	65 [29]	67 [30]
	4	59 [27]	62 [28]	66 [30]	70 [32]	76 [35]	80 [36]	84 [38]	88 [40]	77 [35]	81 [37]	85 [39]	89 [40]
	6	87 [39]	92 [42]	98 [44]	104 [47]	113 [51]	119 [54]	124 [56]	130 [59]	115 [52]	120 [55]	126 [57]	132 [60]
	8	117 [53]	125 [57]	133 [61]	142 [64]	152 [69]	160 [73]	169 [77]	177 [80]	155 [70]	163 [74]	171 [78]	179 [81]
08	1	23 [11]	25 [11]	26 [12]	27 [12]	30 [14]	31 [14]	32 [15]	33 [15]	30 [14]	31 [14]	32 [15]	34 [15]
	2	40 [18]	43 [19]	45 [20]	48 [22]	52 [24]	54 [25]	57 [26]	59 [27]	53 [24]	55 [25]	58 [26]	60 [27]
	3	57 [26]	61 [27]	64 [29]	68 [31]	75 [34]	78 [36]	82 [37]	86 [39]	76 [34]	79 [36]	83 [38]	87 [39]
	4	75 [34]	80 [36]	85 [38]	90 [41]	98 [45]	103 [47]	108 [49]	113 [51]	100 [45]	105 [47]	110 [50]	115 [52]
	6	111 [50]	118 [54]	126 [57]	133 [60]	146 [66]	153 [69]	161 [73]	168 [76]	148 [67]	155 [70]	163 [74]	170 [77]
	8	157 [71]	169 [77]	182 [83]	195 [88]	204 [92]	216 [98]	229 [104]	241 [110]	207 [94]	219 [99]	232 [105]	245 [111]
10	1	28 [13]	30 [13]	31 [14]	33 [15]	36 [16]	37 [17]	39 [18]	40 [18]	36 [16]	38 [17]	39 [18]	41 [18]
	2	48 [22]	51 [23]	54 [25]	57 [26]	63 [28]	66 [30]	69 [31]	72 [33]	64 [29]	67 [30]	70 [32]	73 [33]
	3	68 [31]	73 [33]	77 [35]	82 [37]	90 [41]	95 [43]	99 [45]	104 [47]	91 [41]	96 [44]	101 [46]	106 [48]
	4	89 [41]	96 [43]	102 [46]	108 [49]	119 [54]	125 [57]	131 [60]	138 [62]	120 [55]	127 [58]	133 [60]	139 [63]
	6	133 [60]	142 [64]	152 [69]	161 [73]	176 [80]	186 [84]	195 [88]	204 [93]	179 [81]	188 [85]	198 [90]	207 [94]
	8	183 [83]	197 [90]	212 [96]	226 [103]	241 [109]	255 [116]	270 [122]	284 [129]	244 [111]	259 [117]	273 [124]	288 [131]
12	1	35 [16]	37 [17]	39 [18]	42 [19]	45 [21]	48 [22]	50 [23]	52 [24]	46 [21]	48 [22]	50 [23]	52 [24]
	2	62 [28]	66 [30]	70 [32]	74 [34]	81 [37]	86 [39]	90 [41]	94 [43]	83 [38]	87 [39]	91 [41]	95 [43]
	3	88 [40]	94 [43]	101 [46]	107 [49]	118 [53]	124 [56]	130 [59]	137 [62]	119 [54]	126 [57]	132 [60]	139 [63]
	4	116 [53]	125 [57]	133 [60]	142 [64]	155 [70]	164 [74]	172 [78]	181 [82]	158 [72]	166 [75]	175 [79]	184 [83]
	6	173 [78]	186 [84]	199 [90]	211 [96]	231 [105]	244 [111]	257 [117]	270 [122]	235 [107]	248 [112]	261 [118]	274 [124]
	8	233 [106]	251 [114]	269 [122]	287 [130]	311 [141]	329 [149]	347 [157]	365 [165]	316 [143]	334 [151]	352 [160]	370 [168]
14	1	39 [18]	41 [19]	44 [20]	46 [21]	50 [23]	53 [24]	55 [25]	58 [26]	51 [23]	54 [24]	56 [25]	58 [26]
	2	69 [31]	74 [33]	78 [36]	83 [38]	91 [41]	96 [43]	101 [46]	106 [48]	92 [42]	97 [44]	102 [46]	107 [49]
	3	98 [45]	106 [48]	113 [51]	120 [55]	132 [60]	139 [63]	146 [66]	154 [70]	134 [61]	141 [64]	149 [67]	156 [71]
	4	130 [59]	140 [63]	149 [68]	159 [72]	174 [79]	184 [83]	194 [88]	203 [92]	177 [80]	187 [85]	197 [89]	206 [94]
	6	194 [88]	208 [94]	223 [101]	237 [108]	260 [118]	274 [124]	289 [131]	303 [138]	264 [120]	279 [126]	293 [133]	308 [140]
	8	272 [123]	295 [134]	318 [144]	341 [155]	359 [163]	382 [173]	405 [184]	428 [194]	365 [166]	388 [176]	411 [186]	434 [197]
17	1	45 [20]	48 [22]	51 [23]	53 [24]	58 [26]	61 [28]	64 [29]	67 [30]	59 [27]	62 [28]	65 [29]	68 [31]
	2	79 [36]	85 [39]	91 [41]	97 [44]	106 [48]	112 [51]	117 [53]	123 [56]	108 [49]	113 [51]	119 [54]	125 [57]
	3	114 [52]	122 [56]	131 [59]	140 [63]	153 [69]	162 [73]	170 [77]	179 [81]	155 [71]	164 [74]	173 [78]	181 [82]
	4	150 [68]	162 [73]	173 [79]	185 [84]	203 [92]	214 [97]	226 [102]	237 [108]	206 [93]	217 [99]	229 [104]	240 [109]
	6	224 [102]	241 [109]	259 [117]	276 [125]	302 [137]	319 [145]	336 [153]	354 [160]	307 [139]	324 [147]	341 [155]	359 [163]
	8	206 [93]	206 [93]	206 [93]	206 [93]	309 [140]	309 [140]	309 [140]	309 [140]	315 [143]	315 [143]	315 [143]	315 [143]

NOTE: Unit weight data is shipping weight in pounds [kilograms].

Motor/Drive Weight Data

MOTOR WEIGHTS											
MOTOR TYPE	MOTOR HORSEPOWER										
	1/3	1/2	3/4	1	1 1/2	2	3	5	7 1/2	10	15
ODP	25 [11]	28 [13]	30 [762]	35 [16]	45 [20]	35 [16]	75 [34]	100 [45]	125 [57]	125 [57]	220 [100]
TEFC	28 [13]	35 [16]	33 [338]	45 [20]	65 [29]	70 [32]	85 [39]	105 [48]	145 [66]	160 [73]	295 [134]
E+	N/A	N/A	N/A	40 [18]	55 [25]	55 [25]	90 [41]	100 [45]	145 [66]	130 [59]	300 [136]
2 SPEED	45 [20]	35 [16]	33 [338]	45 [20]	40 [18]	70 [32]	75 [34]	N/A	N/A	N/A	N/A

NOTES:
1. Includes motor, pulleys, belts, and motor base.
2. Motor/drive weight data is shipping weight in pounds [kilograms].

Motor Electrical Data

HORSEPOWER	MAXIMUM MOTOR AMPERAGE							
	VOLTAGE							
	115/1	208/1	230/1	277/1	208/3	230/3	460/3	575/3
1/3	6.3	3.5	3.2	2.6	1.7	1.5	0.8	-
1/2	7.8	4.3	3.9	3.6	2.2	2.1	1.1	0.9
3/4	10.6	5.4	5.3	5.0	3.2	3.0	1.5	1.2
1	15.0	8.3	7.5	5.5	4.0	3.6	1.8	1.4
1 1/2	-	-	-	-	5.3	5.0	2.5	1.9
2	-	-	-	-	7.0	6.4	3.2	2.5
3	-	-	-	-	9.1	9.0	4.5	3.2
5	-	-	-	-	14.2	12.8	6.4	5.2
7 1/2	-	-	-	-	22.2	21.6	10.8	8.2
10	-	-	-	-	28.6	28.4	14.2	11.4
15	-	-	-	-	44.9	40.6	20.3	16.2

NOTES:
1. Actual motor nameplate AMPs may vary, but will not exceed values shown.
2. Consult factory for applications requiring special motors.

General Fan Notes

Forward Curved Fans (Belt Drive)
1. Consult factory for applications at operating conditions not in the following table and curves.
2. Fan motor voltage, fan rotation, and fan RPM may require field setting/adjustment.
3. Drive losses not included in fan performance table and curves.
4. In direction of airflow, after fan discharge – only LPM (Large Plenum) and EHB (Electric Heat Blow Thru) are available.
5. Section will have internal isolation.

Plug Fans (Direct Drive)
1. Consult factory for applications at operating conditions not in the following table and curves.
2. VFD's are recommended for operation and field balancing of units whether factory supplied and factory mounted, field supplied and factory mounted, or field supplied and field mounted.
3. In direction of airflow, there must be space prior to the plug fan inlet. For sizes 02 through 06, the minimum requirement is either an SAM (Small Access) or an MCM (Medium Coil). For sizes 08 through 17, the minimum requirement is an MAM (Medium Access).
4. Section will have internal isolation.

Forward Curved Fan Performance Data

TSP (in-wg)	UNIT SIZE	02					03					04				
	Actual CFM	650	750	850	950	1050	950	1100	1250	1400	1550	1200	1400	1600	1800	2000
3.5	RPM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1793
	BHP	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.99
3.0	RPM	–	–	–	–	–	–	–	–	–	1913	–	–	–	–	1663
	BHP	–	–	–	–	–	–	–	–	–	1.41	–	–	–	–	1.75
2.5	RPM	–	–	–	–	1782	–	–	–	1747	1753	–	–	–	1517	1526
	BHP	–	–	–	–	0.76	–	–	–	1.06	1.21	–	–	–	1.30	1.51
2.0	RPM	–	–	–	1594	1605	–	–	1562	1567	1580	–	–	1357	1366	1383
	BHP	–	–	–	0.55	0.63	–	–	0.75	0.87	1.01	–	–	0.92	1.09	1.29
1.5	RPM	–	–	1382	1395	1415	–	1353	1360	1375	1395	–	1175	1186	1204	1231
	BHP	–	–	0.37	0.43	0.50	–	0.50	0.59	0.70	0.82	–	0.61	0.74	0.89	1.08
1.0	RPM	1126	1136	1154	1181	1215	1107	1117	1136	1161	1195	962	976	1000	1035	*
	BHP	0.18	0.22	0.27	0.32	0.39	0.29	0.36	0.43	0.52	0.63	0.35	0.44	0.56	0.71	*
0.5	RPM	829	863	904	*	*	814	846	*	*	*	718	*	*	*	*
	BHP	0.10	0.14	0.18	*	*	0.17	0.22	*	*	*	0.22	*	*	*	*

TSP (in-wg)	UNIT SIZE	06					08					10				
	Actual CFM	1900	2200	2500	2800	3100	2400	2800	3200	3600	4000	3100	3600	4100	4600	5100
3.5	RPM	–	–	–	–	1482	–	–	–	–	1490	–	–	1234	1239	1245
	BHP	–	–	–	–	2.80	–	–	–	–	3.70	–	–	3.50	4.07	4.70
3.0	RPM	–	–	–	1371	1376	–	–	–	1379	1384	–	1141	1145	1151	1160
	BHP	–	–	–	2.14	2.48	–	–	–	2.83	3.27	–	2.60	3.07	3.59	4.18
2.5	RPM	–	–	1251	1256	1264	–	–	–	1263	1273	–	1044	1049	1057	1070
	BHP	–	–	1.58	1.85	2.16	–	–	–	2.44	2.85	–	2.22	2.64	3.12	3.68
2.0	RPM	–	–	1123	1132	1143	–	–	1129	1139	1155	933	938	945	958	975
	BHP	–	–	1.32	1.57	1.85	–	–	1.73	2.06	2.44	1.51	1.84	2.22	2.67	3.19
1.5	RPM	–	973	983	995	1010	–	978	990	1007	1028	812	820	833	852	875
	BHP	–	0.88	1.07	1.29	1.53	–	1.14	1.39	1.69	2.04	1.18	1.47	1.82	2.23	2.71
1.0	RPM	798	809	823	842	*	801	816	835	858	*	673	689	711	*	*
	BHP	0.52	0.65	0.81	1.00	*	0.66	0.85	1.07	1.33	*	0.87	1.12	1.43	*	*
0.5	RPM	590	*	*	*	*	598	*	*	*	*	*	*	*	*	*
	BHP	0.32	*	*	*	*	0.42	*	*	*	*	*	*	*	*	*

TSP (in-wg)	UNIT SIZE	12					14					17				
	Actual CFM	3900	4600	5300	6000	6700	4600	5400	6200	7000	7800	5200	6200	7200	8200	9200
3.5	RPM	–	–	–	1065	1068	–	–	–	1077	1081	–	–	1078	1084	1094
	BHP	–	–	–	5.13	5.94	–	–	–	6.59	7.55	–	–	6.82	8.06	9.49
3.0	RPM	–	–	–	987	994	–	–	–	1000	1005	–	–	1001	1009	1021
	BHP	–	–	–	4.50	5.28	–	–	–	5.75	6.64	–	–	5.96	7.12	8.46
2.5	RPM	–	–	901	906	915	–	–	911	917	925	–	911	919	930	944
	BHP	–	–	3.28	3.90	4.63	–	–	4.21	4.93	5.75	–	4.21	5.13	6.20	7.44
2.0	RPM	–	805	809	819	832	–	814	819	827	838	814	819	830	844	862
	BHP	–	2.25	2.74	3.32	3.99	–	2.92	3.48	4.13	4.88	2.79	3.48	4.31	5.29	6.44
1.5	RPM	697	701	711	724	741	705	710	718	729	743	708	718	733	751	773
	BHP	1.42	1.78	2.22	2.7500	3.35	1.86	2.28	2.78	3.36	4.03	2.17	2.78	3.52	4.40	5.45
1.0	RPM	574	585	600	619	*	581	591	604	620	638	588	604	624	*	*
	BHP	1.02	1.34	1.72	2.18	*	1.31	1.67	2.09	2.60	3.19	1.57	2.09	2.74	*	*
0.5	RPM	428	*	*	*	*	431	448	*	*	*	444	*	*	*	*
	BHP	0.65	*	*	*	*	0.80	1.08	*	*	*	1.00	*	*	*	*

* Contact factory.

Plug Fan Performance Data

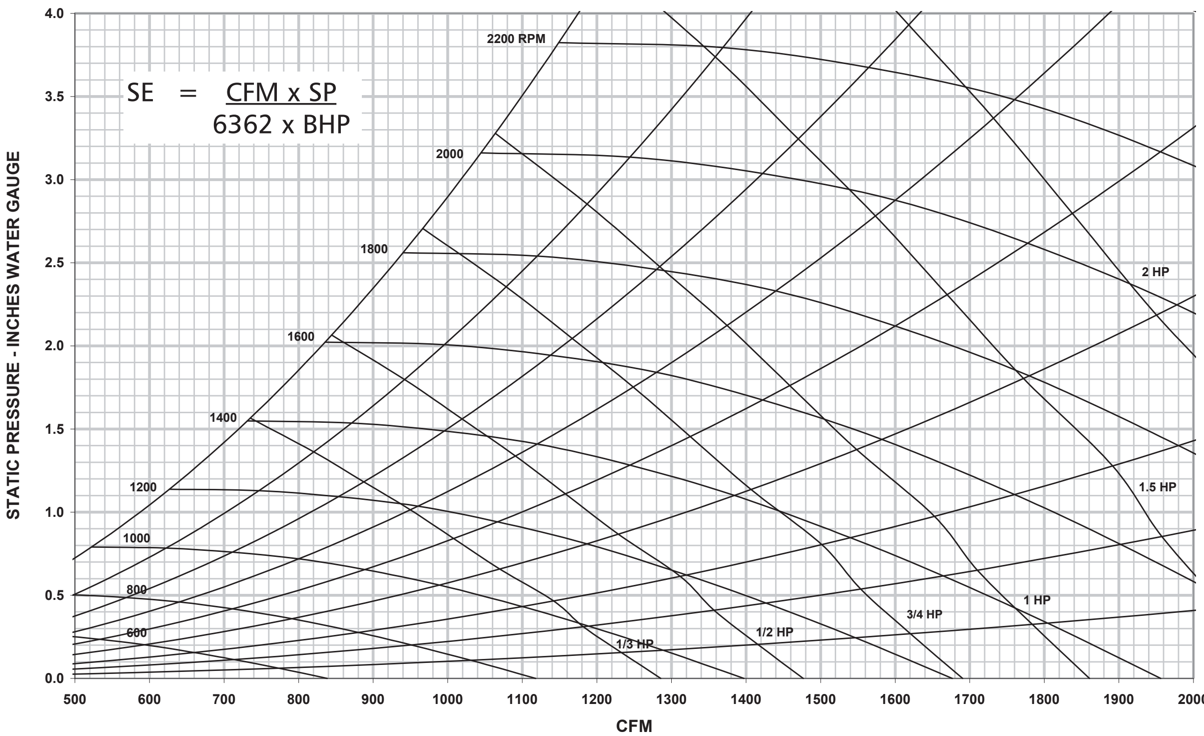
TSP (in-wg)	UNIT SIZE	02					03					04				
	Actual CFM	450	650	850	1050	1250	650	900	1150	1400	1650	800	1150	1500	1850	2200
4.5	RPM	2870	2881	2950	3068	3246	2869	2877	2931	3017	3170	2868	2890	2974	3122	3318
	BHP	0.92	1.08	1.24	1.42	1.65	1.32	1.52	1.71	1.92	2.20	1.58	1.85	2.13	2.48	2.91
4.0	RPM	2704	2725	2805	2946	3135	2703	2721	2786	2891	3048	2701	2734	2829	3000	3218
	BHP	0.79	0.93	1.07	1.25	1.47	1.13	1.31	1.48	1.68	1.94	1.36	1.59	1.85	2.19	2.63
3.5	RPM	2527	2559	2651	2816	3028	2526	2555	2632	2761	2927	2524	2572	2683	2870	3111
	BHP	0.67	0.79	0.91	1.08	1.31	0.96	1.10	1.26	1.46	1.70	1.15	1.35	1.59	1.89	2.34
3.0	RPM	2336	2387	2499	2677	2913	2336	2380	2466	2622	2812	2340	2406	2543	2748	2996
	BHP	0.55	0.65	0.77	0.92	1.15	0.79	0.91	1.05	1.24	1.49	0.94	1.12	1.34	1.65	2.04
2.5	RPM	2139	2207	2347	2552	2788	2141	2199	2313	2479	2687	2146	2226	2391	2622	2871
	BHP	0.44	0.52	0.63	0.79	0.98	0.62	0.73	0.86	1.03	1.27	0.75	0.90	1.10	1.40	1.74
2.0	RPM	1924	2007	2179	2413	2660	1926	2000	2145	2340	2549	1931	2037	2236	2484	2759
	BHP	0.33	0.40	0.50	0.65	0.83	0.47	0.56	0.68	0.85	1.04	0.56	0.69	0.89	1.15	1.54
1.5	RPM	1683	1810	2020	2257	2542	1687	1797	1975	2183	2420	1698	1846	2079	2343	2641
	BHP	0.23	0.29	0.39	0.50	0.71	0.32	0.40	0.52	0.66	0.88	0.39	0.51	0.69	0.94	1.31
1.0	RPM	1415	1597	1833	2117	2401	1419	1580	1788	2029	2280	1433	1644	1904	2202	2500
	BHP	0.14	0.19	0.27	0.41	0.55	0.20	0.27	0.36	0.52	0.69	0.24	0.35	0.51	0.75	0.99
0.5	RPM	1118	1366	1650	1940	2239	1128	1345	1595	1848	2112	1153	1422	1721	2030	2344
	BHP	0.07	0.11	0.18	0.28	0.40	0.10	0.15	0.24	0.34	0.50	0.12	0.21	0.33	0.52	0.75

TSP (in-wg)	UNIT SIZE	06					08					10				
	Actual CFM	1200	1700	2200	2700	3200	1600	2300	3000	3700	4400	1900	2800	3700	4600	5500
4.5	RPM	–	–	2074	2056	2081	1605	–	1728	1755	1812	–	–	1727	1754	1812
	BHP	–	–	3.25	3.55	3.89	2.65	–	3.99	4.47	5.10	–	–	4.95	5.57	6.38
4.0	RPM	–	–	1946	1944	1979	1520	1646	1633	1670	1733	–	1650	1632	1669	1733
	BHP	–	–	2.79	3.06	3.40	2.29	3.06	3.44	3.91	4.49	–	3.79	4.27	4.87	5.61
3.5	RPM	–	–	1810	1823	1871	1429	1532	1532	1581	1649	–	1535	1531	1579	1649
	BHP	–	–	2.35	2.59	2.93	1.95	2.57	2.90	3.37	3.89	–	3.18	3.61	4.19	4.86
3.0	RPM	–	1700	1679	1707	1763	1332	1410	1432	1490	1572	–	1413	1429	1488	1572
	BHP	–	1.73	1.93	2.17	2.47	1.61	2.11	2.42	2.85	3.37	–	2.61	3.00	3.54	4.21
2.5	RPM	–	1541	1539	1581	1645	1226	1289	1326	1391	1488	–	1288	1323	1389	1488
	BHP	–	1.37	1.54	1.76	2.03	1.29	1.67	1.97	2.34	2.83	–	2.07	2.44	2.91	3.54
2.0	RPM	–	1368	1394	1451	1531	1166	1159	1214	1299	1407	–	1158	1211	1296	1407
	BHP	–	1.03	1.18	1.38	1.63	1.07	1.26	1.54	1.89	2.39	–	1.56	1.90	2.35	2.99
1.5	RPM	1202	1192	1238	1313	1411	998	1025	1096	1200	1320	1002	1021	1091	1197	1320
	BHP	0.61	0.71	0.85	1.03	1.27	0.74	0.91	1.14	1.48	1.93	0.91	1.11	1.41	1.84	2.42
1.0	RPM	967	999	1071	1172	1288	817	876	976	1098	1229	817	870	970	1094	1229
	BHP	0.36	0.44	0.56	0.73	0.94	0.44	0.58	0.80	1.11	1.49	0.54	0.71	0.98	1.37	1.87
0.5	RPM	706	784	895	1021	1159	617	720	848	992	1140	609	710	841	987	1140
	BHP	0.16	0.22	0.32	0.45	0.67	0.20	0.32	0.50	0.80	1.14	0.24	0.38	0.61	0.98	1.43

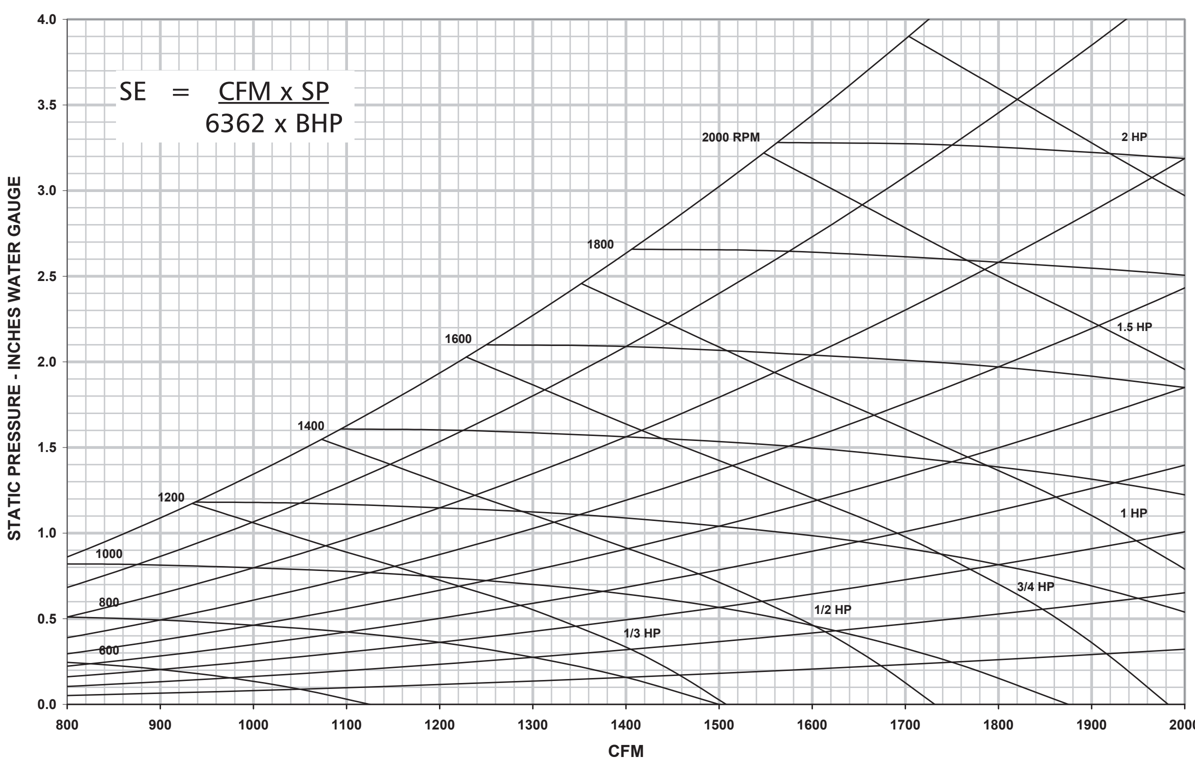
TSP (in-wg)	UNIT SIZE	12					14					17				
	Actual CFM	2600	3800	5000	6200	7400	2900	4300	5700	7100	8500	3400	4800	6200	7600	9000
4.5	RPM	1576	1604	1592	1584	1645	1584	1613	1563	1625	1722	1413	1436	1426	1413	1460
	BHP	3.98	5.04	5.93	6.72	7.79	4.25	5.47	6.32	7.47	8.95	5.11	6.34	7.38	8.28	9.47
4.0	RPM	1490	1516	1484	1508	1581	1498	1524	1488	1560	1661	1336	1357	1330	1345	1402
	BHP	3.46	4.39	5.09	5.88	6.92	3.69	4.77	5.53	6.64	8.02	4.44	5.53	6.34	7.25	8.42
3.5	RPM	1398	1422	1378	1429	1512	1406	1411	1407	1491	1604	1254	1273	1231	1273	1341
	BHP	2.94	3.76	4.32	5.07	6.06	3.15	4.02	4.75	5.81	7.16	3.78	4.73	5.36	6.24	7.37
3.0	RPM	1300	1316	1291	1355	1442	1307	1287	1320	1417	1541	1166	1176	1154	1205	1275
	BHP	2.45	3.13	3.62	4.35	5.24	2.63	3.30	4.00	4.98	6.26	3.15	3.93	4.50	5.33	6.32
2.5	RPM	1192	1182	1197	1274	1375	1197	1167	1239	1348	1477	1068	1056	1069	1133	1215
	BHP	1.98	2.47	2.95	3.63	4.49	2.12	2.64	3.33	4.26	5.42	2.54	3.11	3.67	4.44	5.42
2.0	RPM	1071	1042	1102	1192	1300	1076	1063	1150	1273	1424	960	934	984	1057	1148
	BHP	1.52	1.87	2.34	2.95	3.70	1.63	2.05	2.67	3.51	4.88	1.96	2.36	2.90	3.60	4.46
1.5	RPM	933	924	1001	1107	1238	918	952	1062	1203	1364	831	828	893	981	1088
	BHP	1.09	1.35	1.75	2.3000	3.20	1.14	1.51	2.07	2.95	4.12	1.39	1.70	2.18	2.81	3.79
1.0	RPM	736	797	898	1029	1167	746	835	971	1132	1175	661	716	801	909	1024
	BHP	0.65	0.89	1.23	1.83	2.50	0.70	1.02	1.55	2.33	2.82	0.83	1.12	1.53	2.21	2.99
0.5	RPM	558	660	798	857	1023	579	718	788	982	1175	507	595	711	753	891
	BHP	0.30	0.48	0.82	1.00	1.00	0.34	0.62	1.00	1.00	1.00	0.40	0.62	1.01	1.25	1.25

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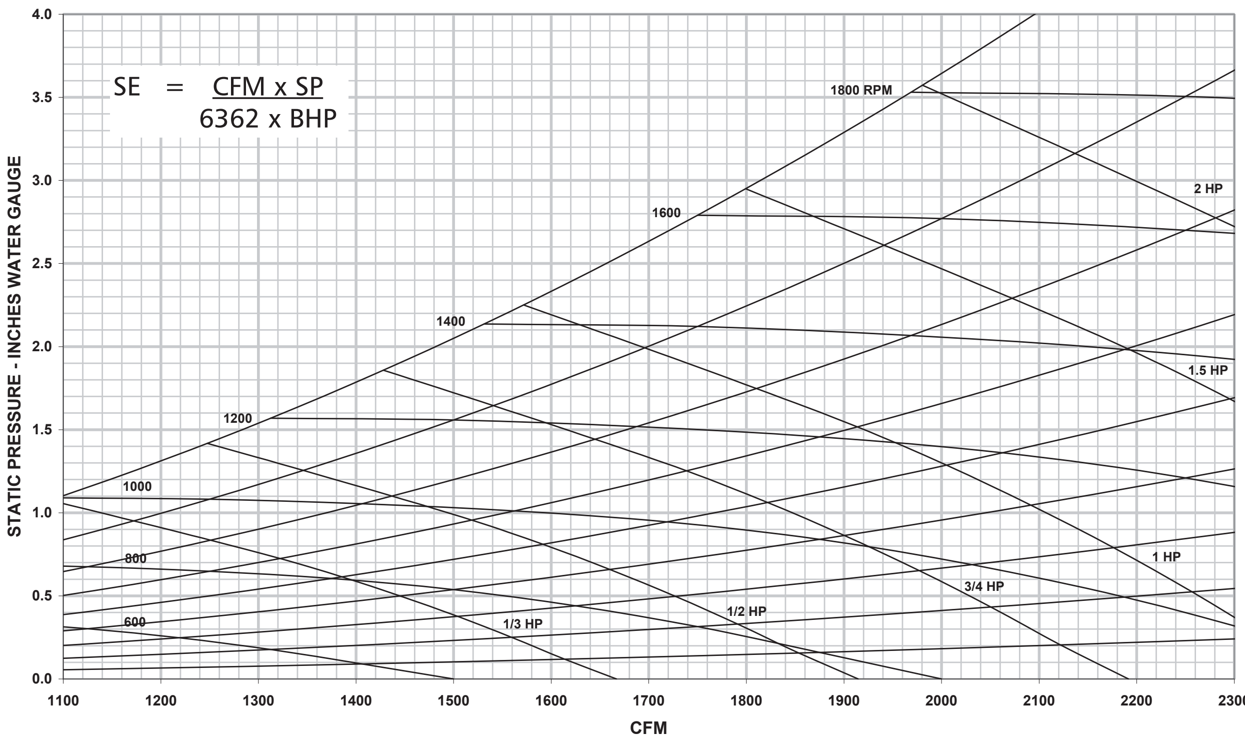
MQL02 (Fan 09-04 Class I)



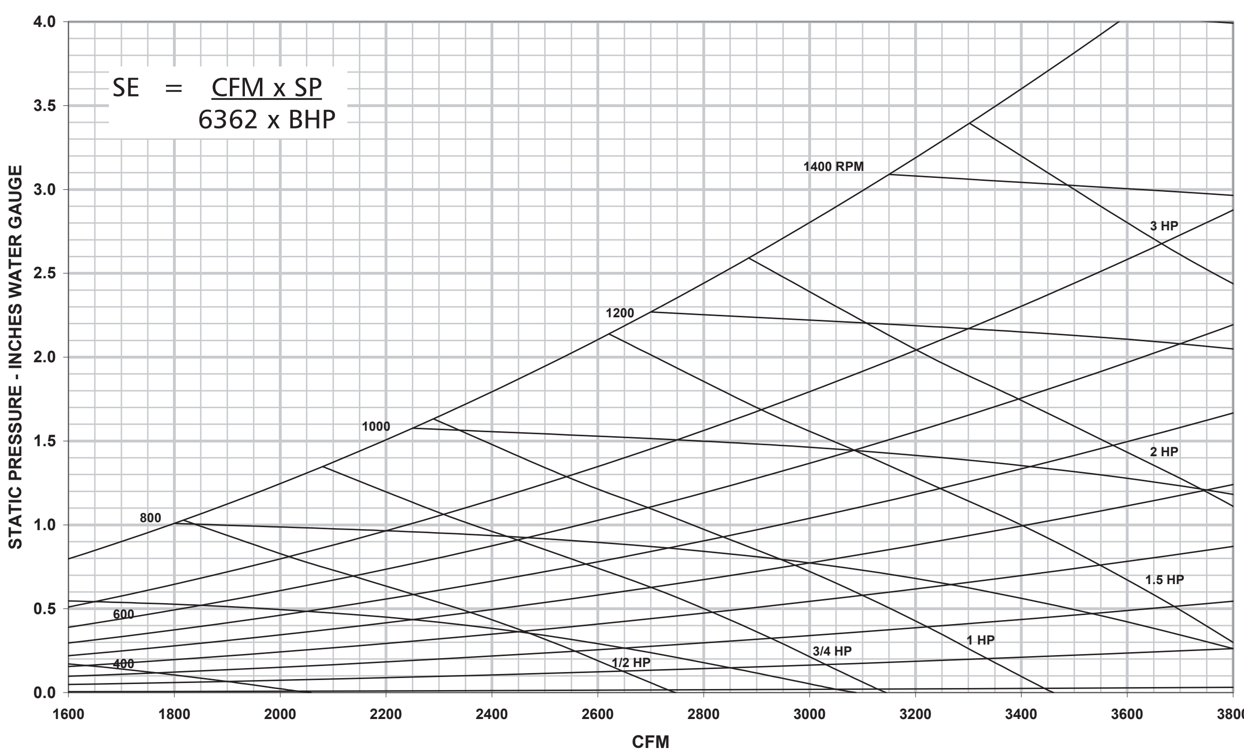
MQL03 (Fan 09-06 Class I)



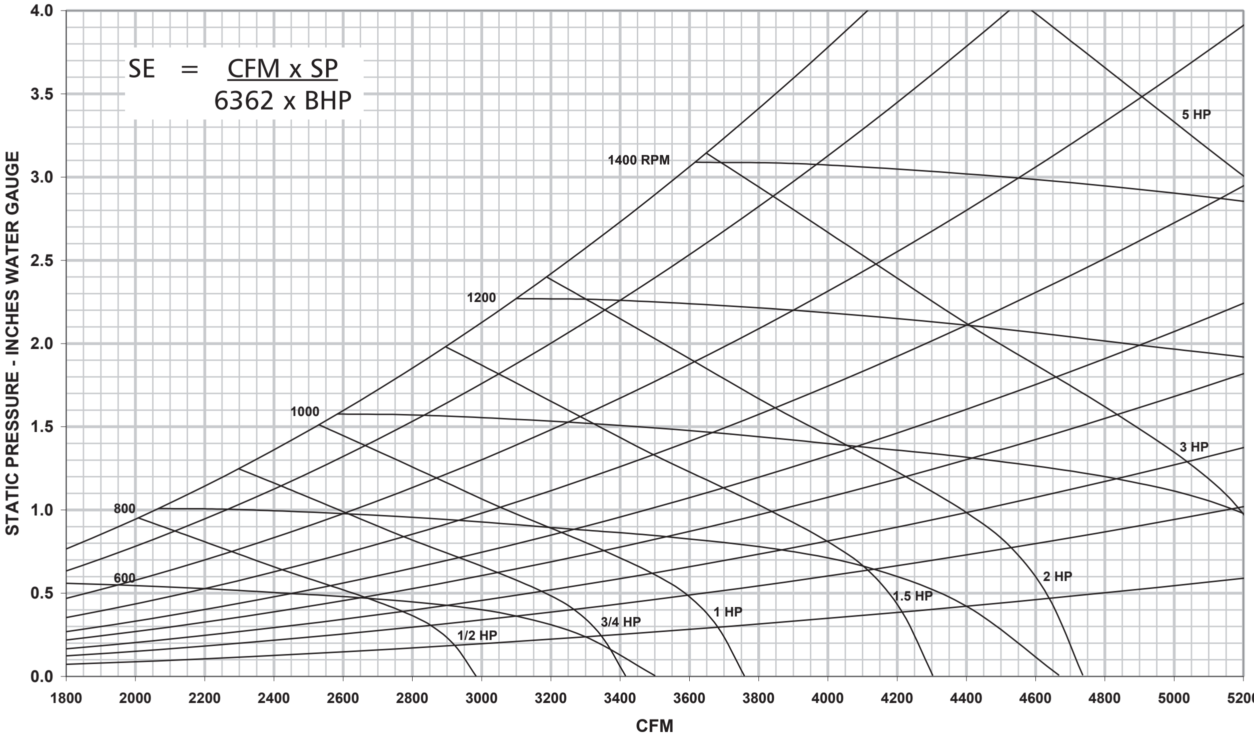
MQL04 (Fan 10-07 Class I)



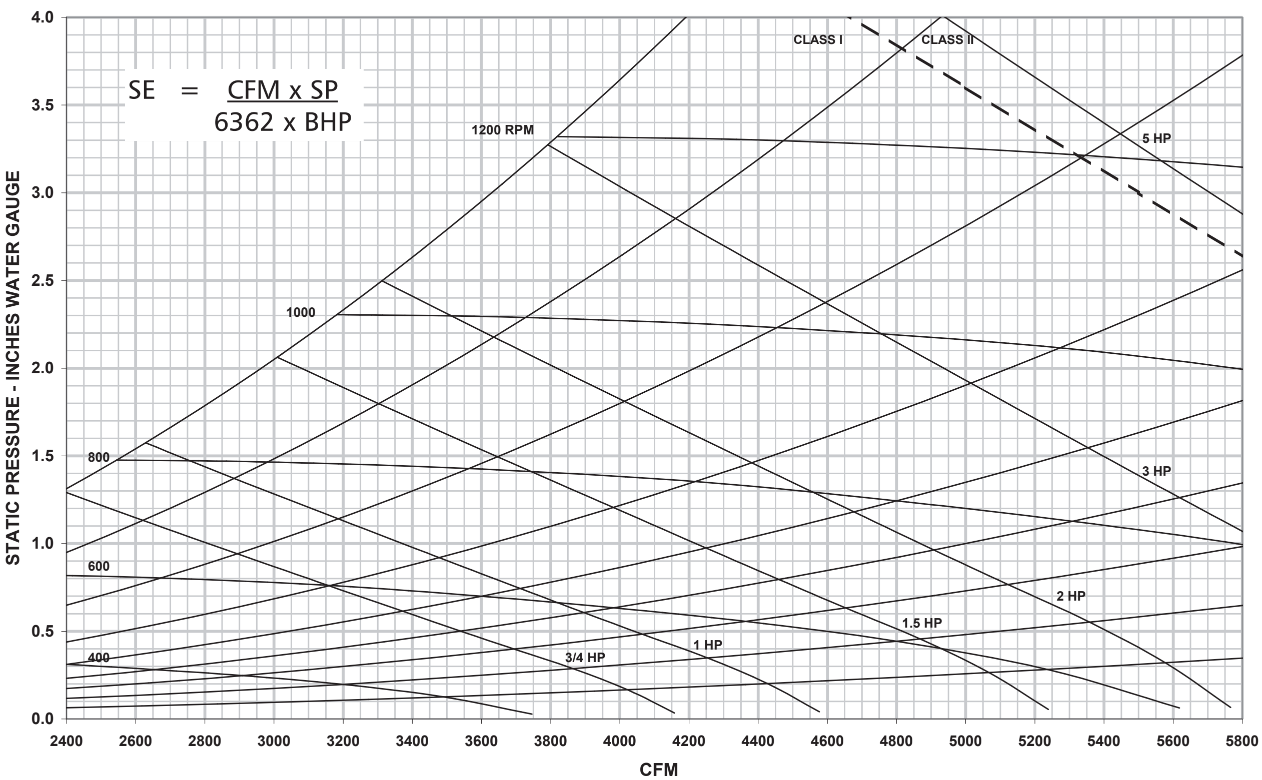
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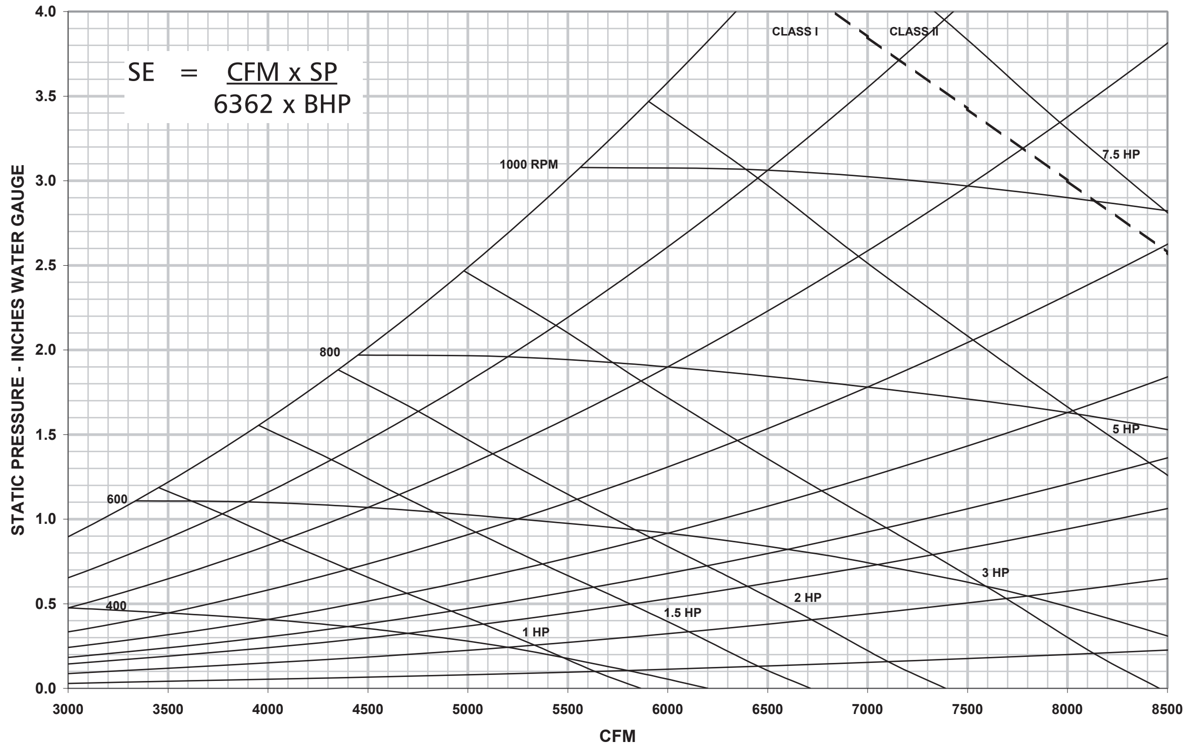
MQL08 (Fan 12-12 Class I)



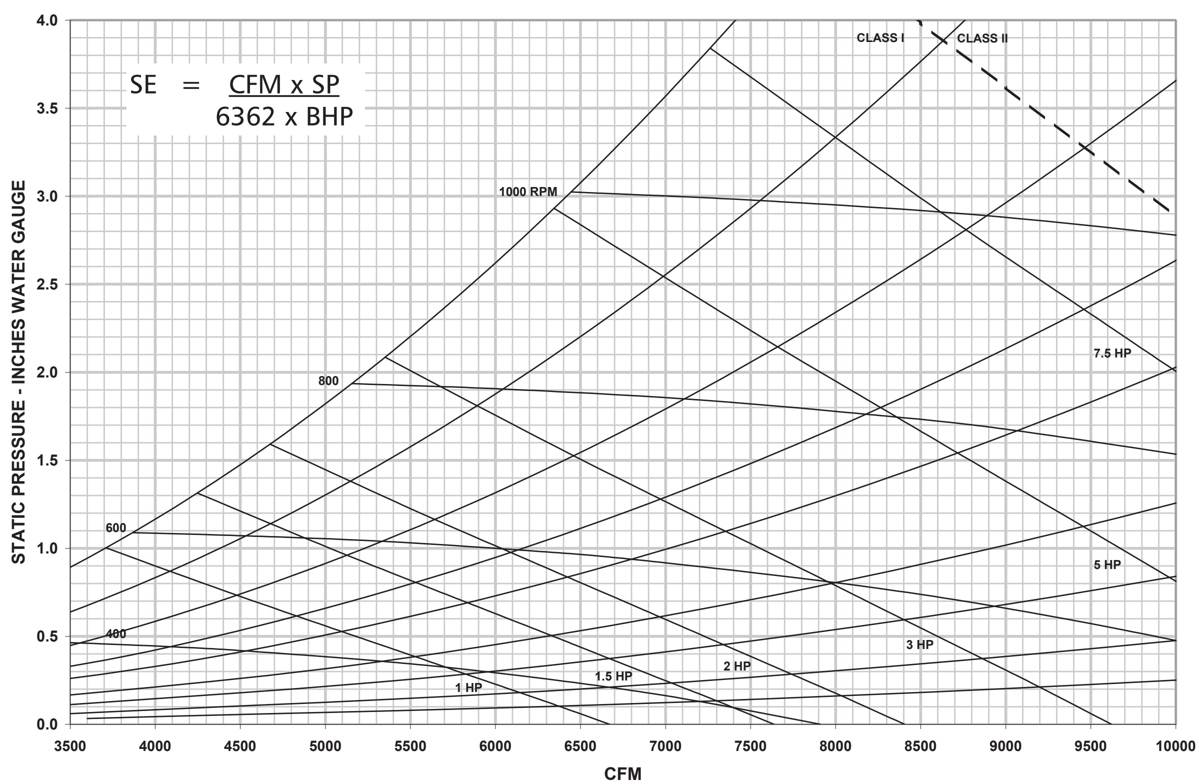
MQL10 (Fan 15-11 Class I and II)



MQL12 (Fan 18-13 Class I and II)

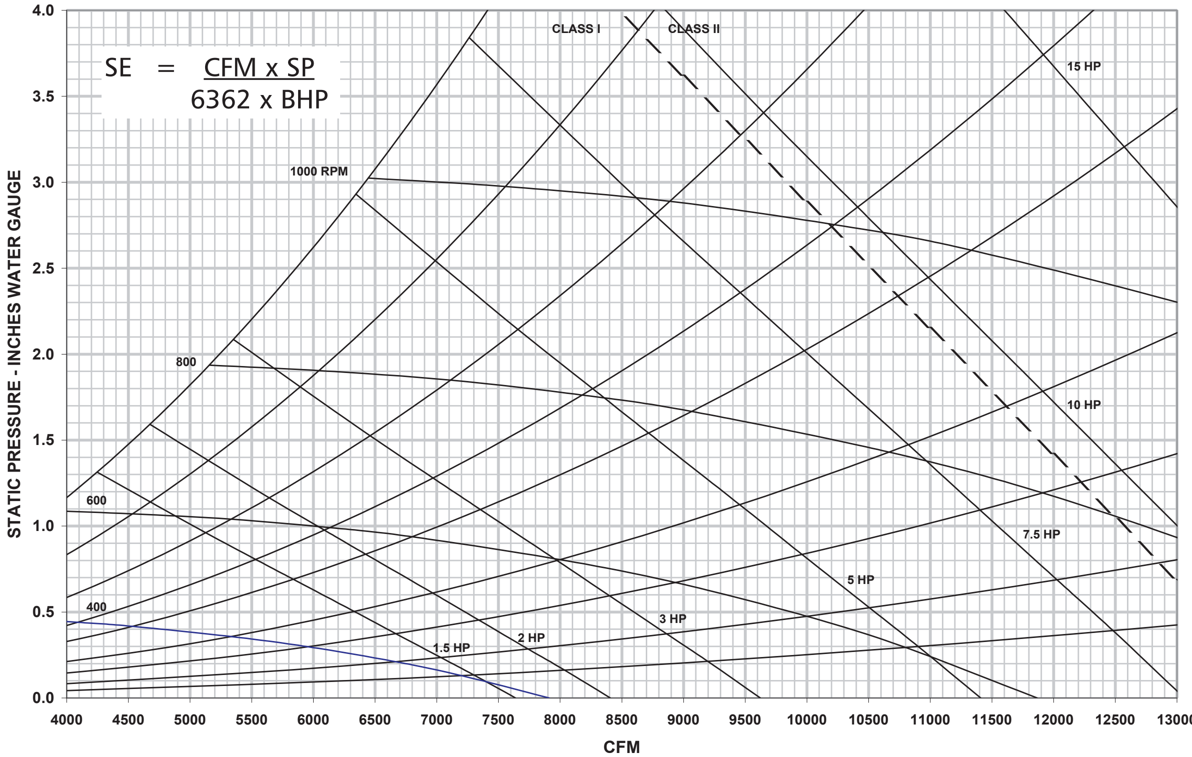


MQL14 (Fan 18-18 Class I and II)

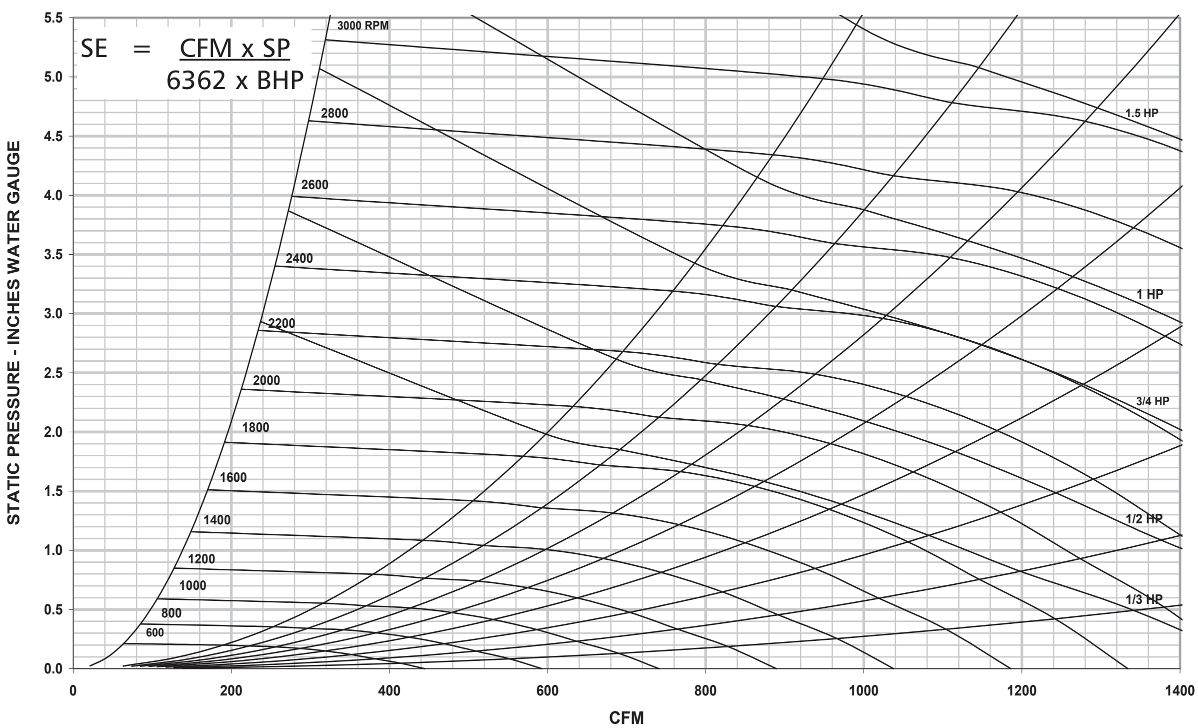


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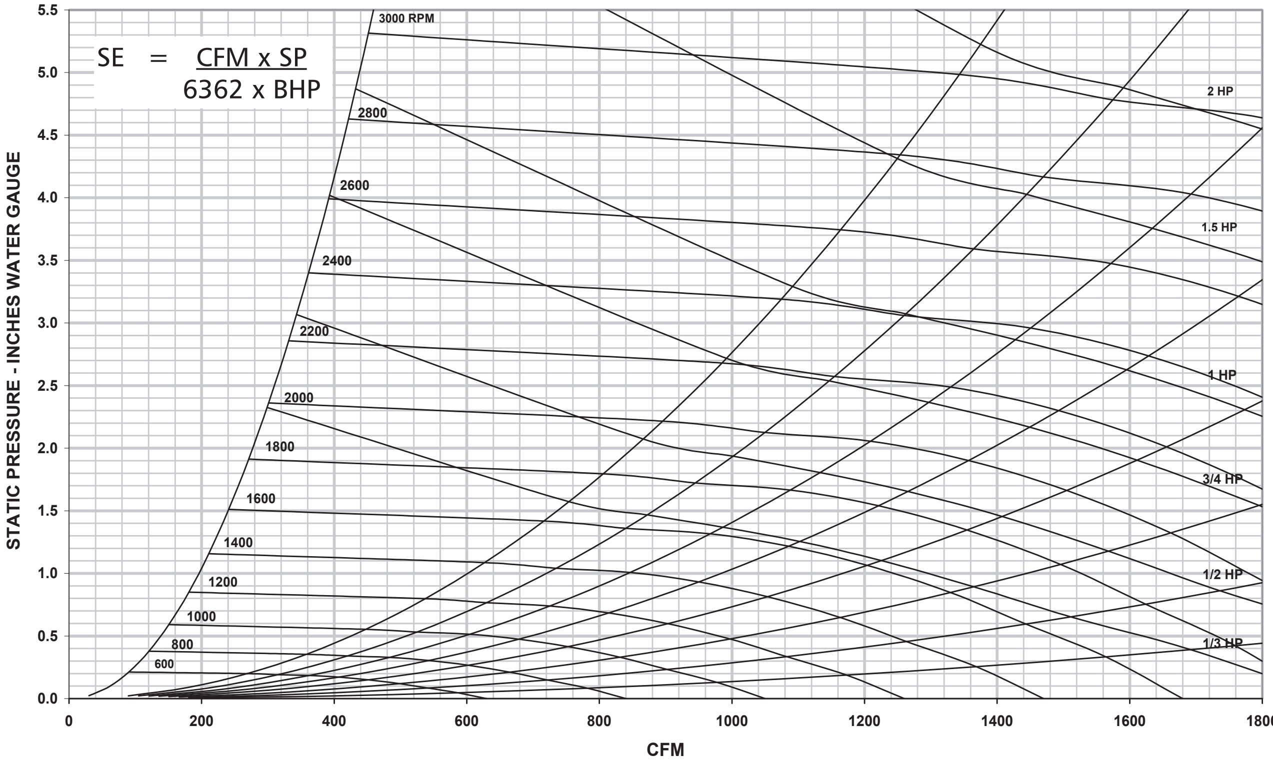
MQL17 (Fan 18-18 Class I and II)



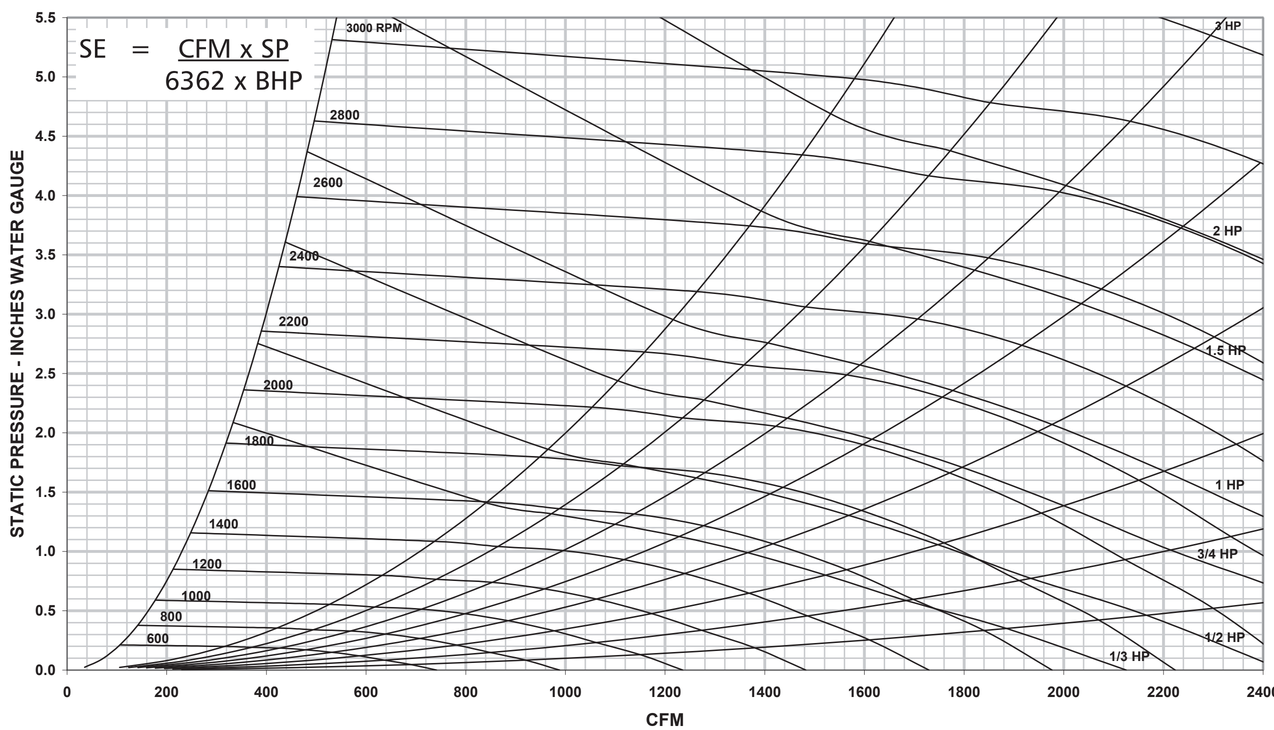
MQL02 Plug Fan



MQL03 Plug Fan

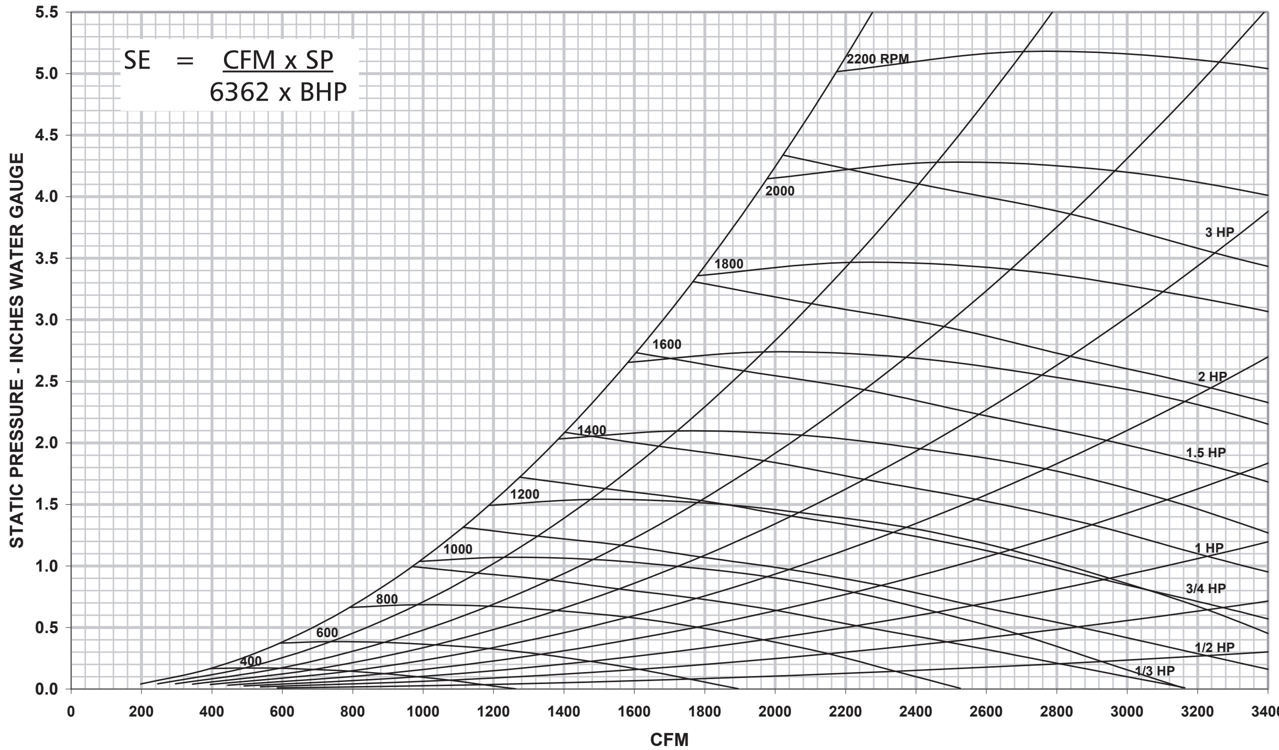


MQL04 Plug Fan

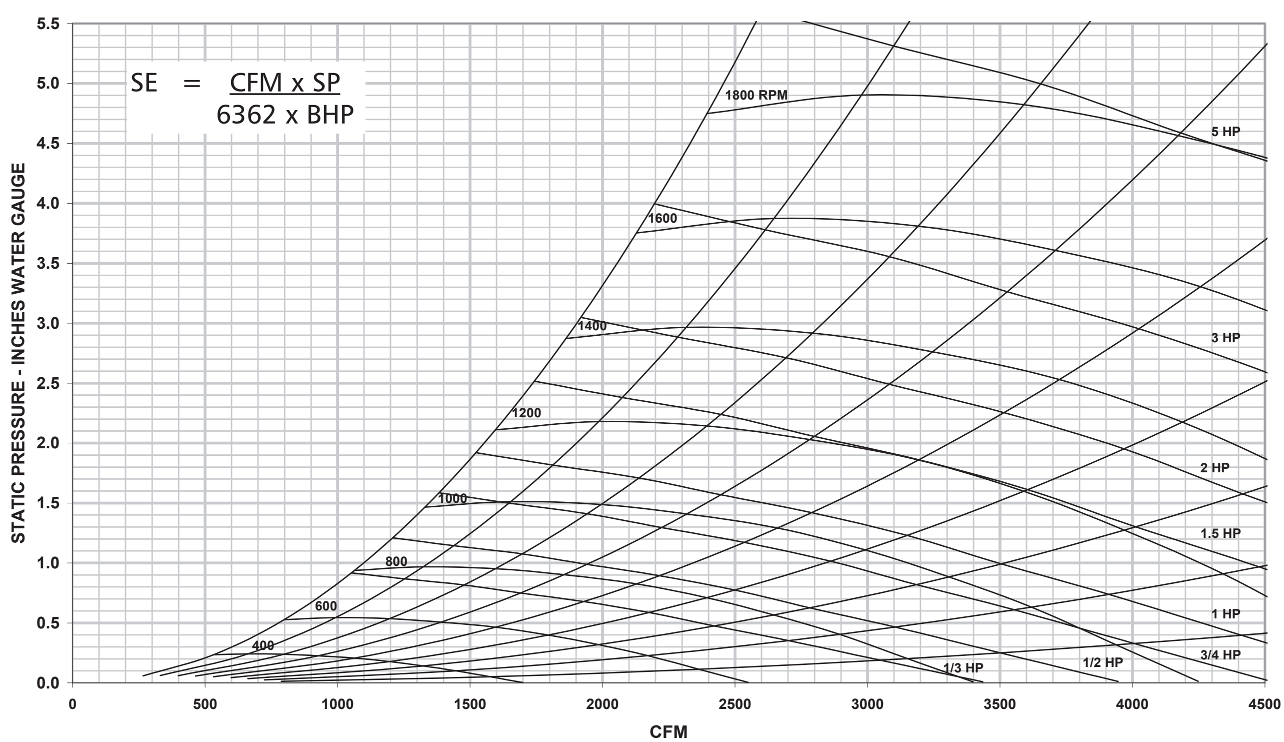


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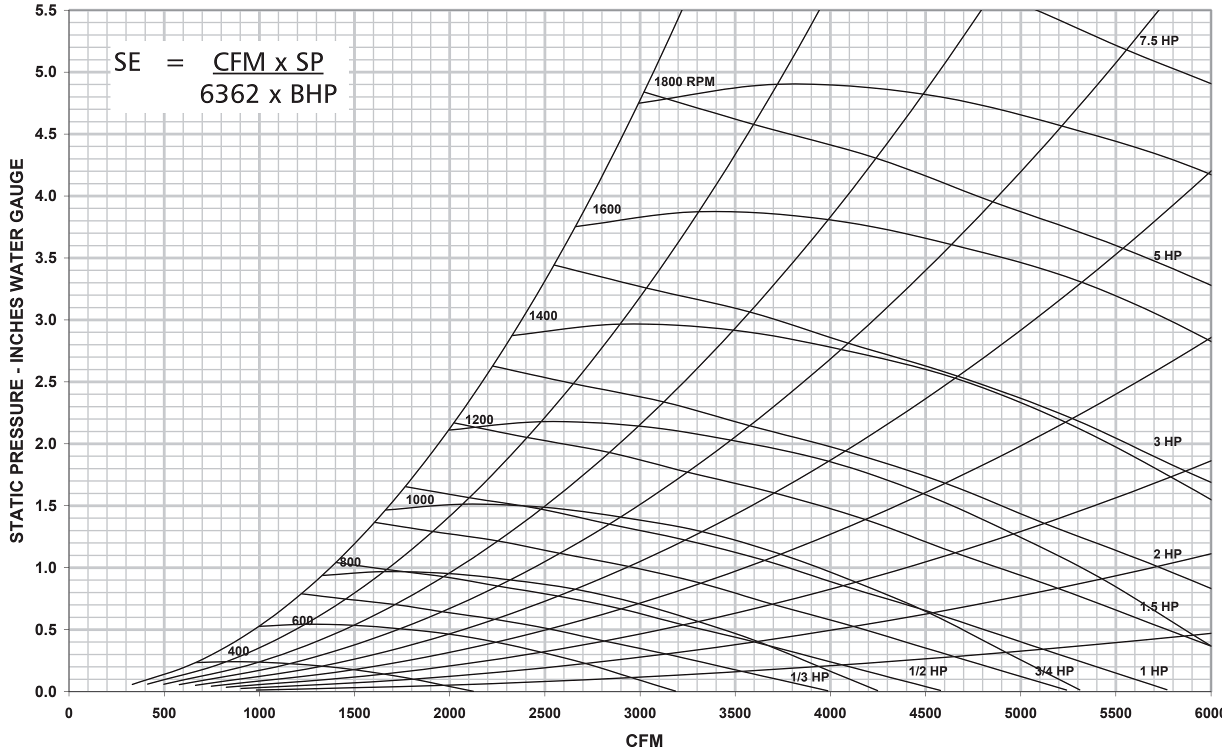
MQL06 Plug Fan



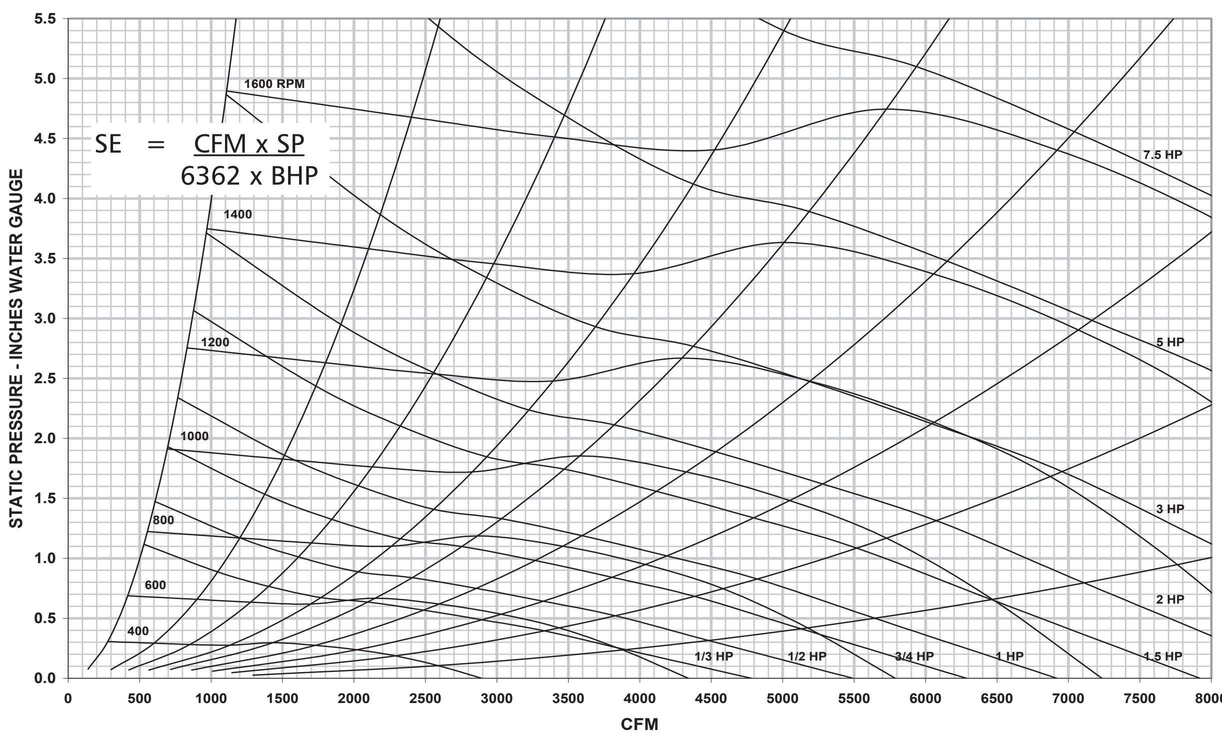
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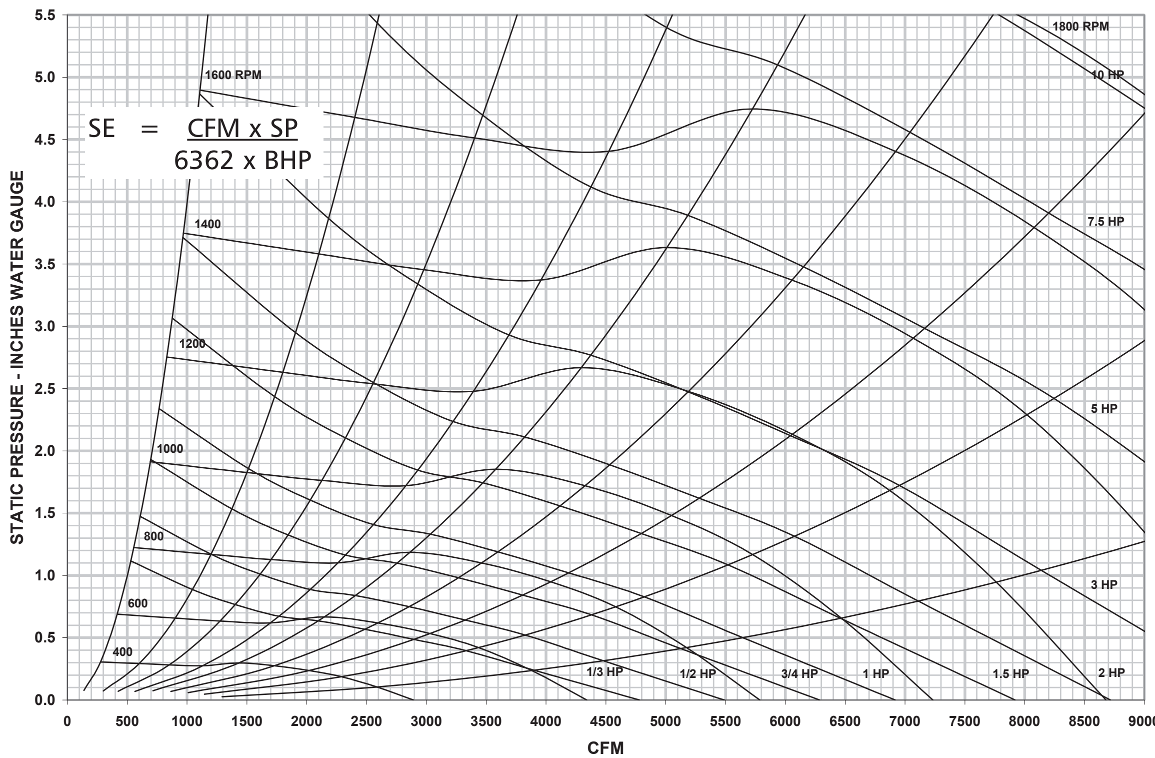
MQL10 Plug Fan



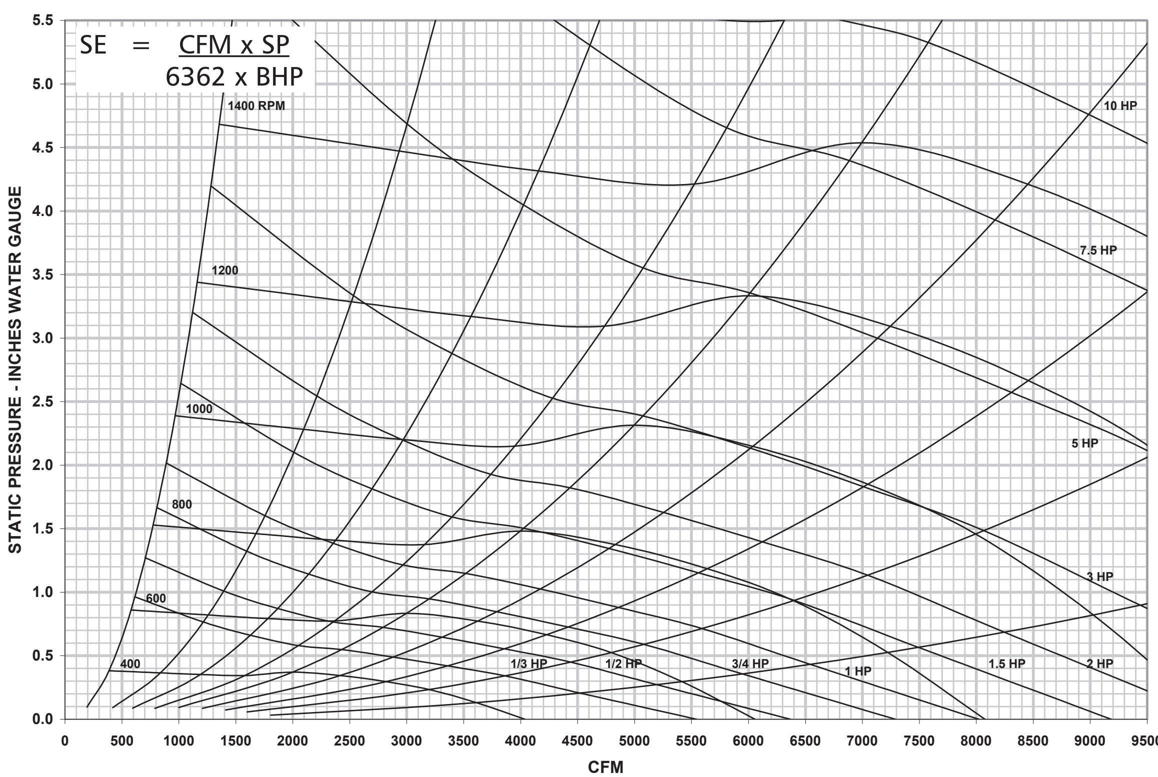
MQL12 Plug Fan



MQL14 Plug Fan



MQL17 Plug Fan



Guide Specifications
Blower Coil Unit

HVAC Guide Specifications - Section 15XXX
Size Range: 600 – 10,000 CFM
ENVIRO-TEC® Model Number: MQL

Part 1 — General
1.01 SYSTEM DESCRIPTION

A. Indoor mounted blower coil unit designed to provide air to a conditioned space as required to meet specified performance requirements for ventilation, heating, cooling, filtration and air distribution. Unit shall be assembled for draw thru application and shall be arranged to discharge conditioned air horizontally or vertically as shown on the contract drawings.
B. Unit with a direct-expansion cooling coil shall have the capability to be used in a refrigerant circuit in conjunction with a field supplied and matched air-cooled condensing unit.

1.02 QUALITY ASSURANCE

A. Coils shall be tested in accordance with ARI 410 “Standard for Forced-Circulation Air-Cooling and Air-Heating Coils”.
B. Direct expansion coils shall be designed and tested in accordance with ANSI/ASHRAE 15 “Safety Code for Refrigeration Systems”.
C. Insulation and insulation adhesive shall comply with NFPA 90A and 90B requirements for flame spread and smoke generation.
D. Unit shall be constructed in accordance with UL 1995 standards, comply with NEMA standards and shall carry the cETL label, display certification symbol on units of certified models. Installation of ancillary electrical components shall comply with NEC.

1.03 DELIVERY, STORAGE AND HANDLING

Unit shall be stored and handled in accordance with the unit manufacturer’s instructions.

Part 2 — Products
2.01 EQUIPMENT

A. General:
Factory assembled blower coil that is modular in design and construction. Unit may consist of a fan and coil section with factory-installed chilled water or direct expansion coil, preheat or reheat coil, heating coil section, filter section, combination filter/mixing box (flat or V-bank arrangement), economizer, or access section(s) as indicated on the equipment schedules.
B. Unit Cabinet:
   1.0 Unit panels shall be constructed of G60 galvanized steel and shall be capable of withstanding 125-hour salt spray test per ASTM Standard 117. All casing panels shall be removable for easy access to the unit. All panels shall be gasketed to ensure a tight seal.
   2.0 Double wall unit panels (includes corner posts, mullions and access doors) shall be 1-in. nominal thickness using 1.5-lbs/ft^3 fiberglass insulation between galvanized steel panels.
   3.0 Single wall unit panels shall be 1-in. nominal thickness using matt-faced fiberglass insulation with a nominal density of not less than 1.5-lbs/ft^3.
   4.0 Insulation shall be secured to casing with water based adhesive corresponding to 25/50-flame spread/smoke developed. Testing criteria and weld pins where necessary.
   5.0 Condensate drain pans shall be sloped to prevent standing water and shall be constructed of 18 gauge G90 galvanized steel or stainless steel; they shall have a galvanized steel or stainless steel male pipe threaded drain connection.
C. Fan Section:
   1.0 Fan sections shall be constructed of G60 steel and shall have a formed channel base for integral mounting of fan, motor, and casing panels. Fan housing, wheel, shaft, and bearings shall be rigidly secured to the base unit.

2.0 Fan decks shall be internally spring isolated (one-inch deflection) with the fan outlet connection to be made using canvas duct.
3.0 Each unit shall have one fan wheel and housing only.
4.0 Fan wheels shall be designed for continuous operation at the maximum rated fan speed and motor horsepower. Fan wheels and shafts shall be selected to operate at least 25% below the first critical speed, and shall be statically and dynamically balanced as an assembly.
5.0 Fan shafts shall be solid steel, turned, ground and polished.
6.0 Fan bearings shall be self-aligning, non-regreasable (permanent) ball bearing type selected for an average life (L_{50}) of 100,000 hours at design operation conditions, per ANSI Code B3.15.
7.0 Fan motor shall be mounted within the fan section casing. Motor shall be NEMA Design B with sizes and electrical characteristics as shown on the equipment schedule.
8.0 Fan drive shall be designed for a minimum of 1.15 service factor and shall be factory mounted and aligned. Belt drive package shall be variable-pitch type (constant volume) or fixed-pitch type (variable volume).

D. Coil Sections:
1.0 All coils shall have aluminum plate fins mechanically bonded to 1/2-in. OD seamless copper tubes by mechanical expansion. Coils shall be factory leak tested at 450-psig air pressure under water in an illuminated test tank. Copper tubes shall be either 0.016" or 0.025" copper tube wall thickness. Coils shall have G90 galvanized steel or stainless steel casings with copper headers and sweat connections.
2.0 Chilled water coils shall have a working pressure of 300-psig at 200° F. No turbulence-promoting devices will be permitted inside the tubes. Headers shall have vent connections.
3.0 Direct-expansion coils shall be provided with pressure-type brass distributors with solder-type connections. Coils shall be designed and tested in accordance with ANSI/ASHRAE 15.
4.0 Hot water coils shall have a working pressure of 300-psig at 200° F. No turbulence-promoting devices will be permitted inside the tubes. Headers shall have vent connections.
5.0 Steam distributing coils (standard single tube type) shall have a maximum working pressure of 15-psig at ambient temperatures above 35° F. Tube wall thickness shall be 0.025" as standard.
6.0 Electric heat coils for use in blower coil units shall be open coil type, nichrome wire resistance elements, insulated by floating ceramic bushings. Thermal cutouts for primary and secondary over-temperature protection shall be provided to meet UL and NEC requirements. Maximum element watt density shall be 55-watts/sq inch. The manufacturer shall furnish an integral control box. It shall contain primary and secondary control thermal cutouts, relays, airflow switch, and fused control transformer.

E. Filter Sections:
1.0 Each filter section shall be designed and constructed to house the specific type of filter specified on the equipment schedule.
2.0 Flat filter sections shall accept 2-in. 30% (MERV-6) pleated filters of standard sizes. Sections shall include side access slide rails. Flat filter section shall be arranged with minimum depth in direction of airflow.
3.0 Angle filter section shall accept 2-in. 30% (MERV-6) pleated filters of standard sizes arranged in horizontal V formation. Sections shall include side access slide rails. Angle filter section shall be arranged with minimum depth in direction of airflow.

F. Damper Sections:
1.0 Mixing boxes, filter mixing boxes and economizers shall have parallel blade, interconnecting dampers. Damper blades shall have parallel bends for stiffness and shall be mechanically fastened to steel rods rotating in brass bushings and mounted in rigid galvanized steel frames. Dampers shall be sectionalized to limit blade width, minimize blade warpage, and ensure tight closure.
2.0 All dampers for mixing boxes and filter mixing boxes shall be rated with a leakage rate not to exceed 5% of air quantity calculated at 2000 fpm velocity though damper and 4.0-in.wg. pressure difference. Damper blades shall be gasketed and stainless steel perimeter-sealing strips shall be provided. Damper linkage shall be provided and installed with all mixing boxes.

G. Access Sections:
1.0 Access sections shall be installed where indicated on the drawings and shall be as specified on the equipment schedule.
2.0 Access sections shall have removable access panels.

H. Special Features:
The following unit options shall be available.
1.0 Fan Section:
a. Variable frequency drives.
b. Motor starters – contactor with overload for three phase and contactor for single phase.
c. High-efficiency motors (inverter-duty).
d. Totally enclosed fan cooled (TEFC) motors (inverter-duty).
e. Two-speed motors.
f. Direct drive plug fans with internal isolation.
g. Class II forward curved fans with regreasable pillow block bearings.
h. Exhaust or return fans for use with economizer sections.
2.0 Coil Section:
a. Chilled water coil with copper plate fins and/or stainless steel casing.
b. Direct-expansion coil with copper plate fins and/or stainless steel casing.
c. Hot water coil with copper plate fins and/or stainless steel casing.
d. Steam distributing coil with copper plate fins and/or stainless steel casing.
3.0 Filtration:
a. 4” pleated filter type (standard size), 60-65% efficiency (MERV-11)
b. 4” pleated filter type (standard size), 80-85% efficiency (MERV-13)
c. 4” pleated filter type (standard size), 90-95% efficiency (MERV-14)
4.0 Access Doors: Hinged (lift-off type) doors with quick-action latches (handles) on both sides of the section for access to both the fan and filter from either side of the unit.
5.0 Base Rail: Unit mounted base rail shall be a minimum of 4” in height and constructed of galvanized steel, structurally capable of supporting unit on floor or by ceiling suspension.

I. End Devices:
The following guide specifications should be used as a basis for design when using optional factory/field-mounted direct digital controls. These specifications should be reviewed to match the specific system control requirements and available control packages.
1.0 The electrical components shall be recognized by UL. The unit shall be in compliance with the UL 1995 standards. Fan motors are wired and terminated in the control enclosure.
2.0 All application software performing the required control functions shall be field-supplied with the DDC controller factory or field mounted and wired (tested and configured).
3.0 Available End Devices and Controls:
a. Variable Frequency Drives
 • Factory supplied and mounted
 • Field supplied and factory mounted
b. Motor Starters
 • Factory supplied and mounted
 • Field supplied and factory mounted
c. End Devices (factory supplied and mounted)
 • Disconnect switch (fused or non-fused)
 • Damper actuator (modulating from 100% OA to 100% RA)
 • Fuses, relays, transformers, etc.
 • Electric heat interlock relay
 • Hand off auto switch

ENVIRO-TEC® BY JOHNSON CONTROLS

Metric Conversion Chart

SI UNIT	CONVERSION FACTOR	= ENGLISH UNIT	CONVERSION FACTOR	= SI UNIT
Area				
cm^2			100	mm^2
cm^2	0.1550	in^2	645.2	mm^2
m^2	10.76	ft^2	0.09290	m^2
Length				
mm	0.03937	in.	25.4	mm
mm	0.003281	ft.	304.8	mm
m	3.281	ft.	0.3048	m
m	1.094	yd.	0.9144	m
Mass				
g	0.03527	oz.	28.35	g
kg	2.205	lb.	0.4536	kg
tonne, Mg	1.102	U.S. ton (2000 lb.)	0.9072	tonne, Mg
Power				
kcal/h			1.163	W
kcal/h	3.968	Btu/h	0.2931	W
HP metric			0.7355	kW
HP metric	0.9863	HP (550 $\frac{ft. lb.}{S}$)	0.7457	kW
Mcal/h			1.163	kW
Mcal/h	0.3307	Ton refr.	3.517	kW
Pressure				
mm w.g. 4°C			9.806	Pa
mm w.g. 4°C	0.03937	in H_2O 39.2°F	249.1	Pa
mm Hg 0°C			0.1333	kPa
mm Hg 0°C	0.03937	in Hg 32°F	3.386	kPa
kg_f/cm^2			98.07	kPa
kg_f/cm^2	14.22	psi	6.895	kPa
mH_2O	3.281	ft H_2O	2.989	kPa

SI UNIT	CONVERSION FACTOR	= ENGLISH UNIT	CONVERSION FACTOR	= SI UNIT
Temperature Interval				
°C	1.8	°F	0.5556	°C
Velocity				
m/s	3.281	ft/s	0.3048	m/s
m/s	196.9	ft/min	0.00508	m/s
Volume				
mm^3			1.0×10^{-6}	L
mm^3	6.102×10^{-5}	$in.^3$	0.01639	L
L	0.03531	ft^3	28.32	L
m^3	1.308	yd^3	0.7646	m^3
L	0.2642	U.S. gal	3.785	L
L	2.113	U.S. pint	0.4732	L
mL, cm^3	0.03381	U.S. oz	29.57	mL
Volume / Time				
m^3/h			0.2778	L/s
m^3/h	0.5886	ft^3/min	0.4719	L/s
m^3/h	4.403	U.S. gal/min	0.06309	L/s
L/h			2.778×10^{-4}	L/s
L/h	4.403×10^{-3}	U.S. gal/min	0.06309	L/s
$(m^3/h)/$ (1000 kcal/h)	1.780	cfm/ton	0.1342	L/s - kW

SI UNIT	CONVERSION FACTOR	= ENGLISH UNIT	CONVERSION FACTOR	= SI UNIT
Temperature				
°C			°C + 273.15	°K
°C	(°C x 1.8) + 32	°F	(°F - 32) ÷ 1.8	°C

PREFIXES

M	MEGA-	10^6
k	KILO-	10^3
d	DECI	10^{-1}
c	CENTI	10^{-2}
m	MILLI	10^{-3}

LEGEND

m	METER
cal	CALORIE
kg	KILOGRAM (mass)
kgf	KILOGRAM — FORCE
kp	KILOGRAM — FORCE
L	LITER
°C	DEGREES CELSIUS
K	KELVIN
W	WATT
Pa	PASCAL
J	JOULE
N	NEWTON
h	HOUR
m	MINUTE
s	SECOND
g	GRAM

UNITS

HP metric =	METRIC HORSEPOWER
mm w.g.	MILLIMETERS WATER GAUGE
mmCE	MILLIMETERS WATER GAUGE
mmHg	MILLIMETERS MERCURY
tonne =	1000 kg
kcal =	KILOCALORIES
bar =	100 kPa

NOTES

MQL • Standard & Optional Features

ENVIRO-TEC® BY JOHNSON CONTROLS

STANDARD FEATURES

Construction
- Modular design facilitates retrofit
- Galvanized steel cabinet construction
- 1" thick fiberglass insulation, glued and pinned in place
- Gasketed, removable access panels sized for easy handling
- Left and right hand arrangement
- Access panels on all sections

Fan Assembly
- Single forward-curved fan sections
- Statically and dynamically balanced
- Solid steel shafting
- Ball bearings with a minimum design average life (L_{50}) of 100,000 hours
- Fan decks with internal vibration isolation

Fan Motor and Drive
- Single speed ODP motors
- 1750 RPM single speed, 60 Hertz
- Single phase motors with inherent thermal protection
- Three phase motors
- Standard cross section "V-belt" drive with 1.2 service factor
- Adjustable pitch motor pulley and fixed pitch blower pulley

Coils
- 1/2" O.D. seamless copper tubes
- G90 steel coil casings
- Collared aluminum fins
- Manual air vent plug on all water coils
- 300 PSIG Working Pressure at 200°F
- Copper ODM sweat connections
- 0.016" tube wall on water and evaporator coils
- 0.025" tube wall on steam coils

Filters and Filter Rack
- Hinged side access flat filter rack
- 2" pleated filters (30%)

Electrical
- Fan motor wired and terminated to junction box
- All units cETL listed in compliance with UL/ANSI 1995

Electric Heat Section
- Draw Thru or Blow Thru configurations
- Factory mounted electric heater with single point power connection, ETL listed as an assembly

OPTIONAL FEATURES

Construction
- Double wall (solid or perforated) cabinets
- Stainless steel IAQ drain pan with stainless steel male pipe threaded connection
- Fan discharge arrangements
- Scrim reinforced foil faced insulation
- Hinged access panels with lift and turn fasteners
- 4" Base rails with rigging slots factory assembled and installed

Fan Motor and Drive
- Direct drive plug fans with internal rubber-in-shear (RIS) isolation
- TEFC motors
- High efficiency motors
- Two-speed motors with contactors
- Variable frequency drives, factory installed (mounted and wired)
- Motor starter (contactor with overload for three phase; contactor for single phase), factory installed (mounted and wired)
- Return FC and plug fan sections

Coils
- 3, 4, 6 and 8 row chilled water or R22 DX coils
- Up to 4 rows hot water or up to 2 rows standard steam
- Heating coil in preheat or reheat position
- Coil connections opposite handing
- Stainless steel coil casings
- 0.025" tube wall thickness
- Auto air vents

Filters and Filter Rack
- 4" high efficiency pleated filters (65, 85, and 95%)
- Mixing box with filter sections (flat or v-bank filter arrangements)

Inlet Damper Section
- Factory assembled and installed
- Heavy gauge galvanized steel formed blade dampers
- Low leak dampers with extruded vinyl blade seals and flexible metal jamb seals
- Medium and large inlet plenums with v-bank or flat filters
- Parallel blade operation
- Interconnecting damper linkage
- Damper actuator (modulating from 100% OA to 100% RA)

Additional Modules
- Face and bypass with medium and small coils
- Economizer sections
- Discharge plenums
- Access sections
- High efficiency filter sections

Electrical
- Motor wiring in conduit
- Single phase fan control package
- Three phase fan control package
- Door interlocking disconnect switch (non-fused or fused)
- Fusing (main or per stage)
- Hand off auto switch (HOA)
- Frequency inverters
- Electric heat interlock relay
- Relays, transformers, etc.

Printed on recycled paper

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